

**UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN**

NALCO COMPANY LLC, ECOLAB INC.,
HAZELMERE RESEARCH LTD., ECOLAB
USA INC., NALCO HOLDING COMPANY,
NALCO U.S. 2 INC., and MOBOTEC AB,
LLC,

Plaintiffs,

v.

WISCONSIN POWER AND LIGHT
COMPANY, WISCONSIN PUBLIC SERVICE
CORPORATION, MADISON GAS AND
ELECTRIC COMPANY, d/b/a COLUMBIA
ENERGY CENTER (UNIT 1), and PORTAGE
FUELS COMPANY LLC,

Defendants.

WISCONSIN POWER AND LIGHT
COMPANY, WISCONSIN PUBLIC SERVICE
CORPORATION, MADISON GAS AND
ELECTRIC COMPANY, d/b/a COLUMBIA
ENERGY CENTER (UNIT 1), and PORTAGE
FUELS COMPANY LLC,

Counterclaimants,

v.

NALCO COMPANY LLC and HAZELMERE
RESEARCH LTD.,

Counterclaim Defendants.

Civil Action No.: 3:18-CV-280

**DEFENDANTS' BRIEF IN OPPOSITION TO
PLAINTIFFS' MOTIONS FOR SUMMARY JUDGMENT**

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TABLE OF FREQUENTLY USED TERMS

Term	Definition
'692 Patent	U.S. Patent No. 6,808,692 to Oehr
'235 Patent	U.S. Patent No. 6,250,235 to Oehr
'282 Patent	U.S. Patent No. 5,817,282 to Oehr
'548 Patent	U.S. Patent No. 8,142,548 to Oehr
'803 Patent	U.S. Patent No. 5,458,803 to Oehr
'805 Patent	U.S. Patent No. 5,645,805 to Oehr
279 Case	<i>Nalco Co. v. Wis. Pub. Serv. Corp.</i> , No. 3:18-cv-279 (W.D. Wis.)
280 Case	<i>Nalco Co. v. Wis. Power & Light Co.</i> , No. 3:18-cv-280 (W.D. Wis.)
AECS	Alliant Energy Corporate Services, Inc.
AJG Coal	Arthur J. Gallagher Coal, Inc.
APS	Arizona Public Service
Arbor	Defendant Arbor Fuels Company, LLC
Asserted Claims	Claims 1, 8–19, and 22–29 of the '692 Patent
CaBr ₂	The chemical symbol for calcium bromide
Chem-Mod	Non-party Chem-Mod LLC
Chem-Mod Case	<i>Nalco Co. v. Chem-Mod LLC</i> , No. 1:14-cv-2510 (N.D. Ill.), filed on April 8, 2014
Chem-Mod Solution	Chem-Mod's method for treating coal, usually comprising the addition of MerSorb and S-Sorb to coal prior to combustion
Defendants' construction (or variations of that phrase)	The proposed construction of terms from the '692 Patent offered by Defendants in the parties' Amended Joint Table of Terms Requiring Construction, filed at D.I. # 88.
Gallagher Clean Energy	Gallagher Clean Energy, LLC
Hazelmere	Plaintiff Hazelmere Research Ltd.
Hg	The chemical symbol for mercury
MerControl 7895	The aqueous mixture of calcium bromide and water marketed by Nalco
MerSorb	The aqueous mixture of calcium bromide and water used as part of the Chem-Mod Solution
MGE	Defendant Madison Gas and Electric Company
Nalco	Plaintiff Nalco Company LLC
NMI	Nalco Mobotec, Inc., Nalco's predecessor in interest
NO _x	The chemical symbol for nitrogen oxides

TABLE OF FREQUENTLY USED TERMS

Term	Definition
Plaintiffs' construction (or variations of that phrase)	The proposed construction of terms from the '692 Patent offered by Plaintiffs in the parties' Amended Joint Table of Terms Requiring Construction, filed at D.I. # 88
Portage	Defendant Portage Fuels Company, LLC
POSA	A person of ordinary skill in the relevant art
Refined Coal	Coal treated according to the Chem-Mod Solution
SAC	Plaintiffs' Second Amended Complaint in the 279 and 280 Cases
Section 45	26 U.S.C. § 45
SO _x	The chemical symbol for sulfur oxides
█	█
S-Sorb	A dry powder sorbent used as part of the Chem-Mod Solution
WPS	Defendant Wisconsin Public Service Corporation
WPL	Defendant Wisconsin Power and Light Company
2004 Statute	The American Jobs Creation Act of 2004, PL 108-357, 118 Stat. 1552 (Oct. 22, 2004)
2008 Statute	The Emergency Economic Stabilization Act of 2008, PL 110-343, 122 Stat. 3808 (Oct. 3, 2008)
2010 Statute	The Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010, PL 111-312, 124 Stat. 3297 (Dec. 17, 2010)

Defendants Wisconsin Power and Light Company (“WPL”), Wisconsin Public Service Corporation (“WPS”), Madison Gas and Electric Company (“MGE”), and Portage Fuels Company LLC (“Portage”) submit this memorandum in opposition to Plaintiffs’ motion for partial summary judgment. For the reasons set forth below, Plaintiffs’ motions should be denied.

PRELIMINARY STATEMENT

In these cases, Plaintiffs seek to expand a patent that is narrowly targeted to one method for introducing chemicals into coal-burning power plants—“injecting into the flue gas”—in order to sweep in the two other, distinct methods that they accuse Defendants of practicing. But the intrinsic record could not be clearer: the claims do not cover either pre-treating coal or injecting chemicals into the combustion zone. Plaintiffs’ expansive reading creates a myriad of problems for their case, from the commonplace (ensnarement of the prior art and infirmity under section 112) to the more particular: if Plaintiffs are correct about the Patent’s scope, then [REDACTED]

[REDACTED]

The parties’ cross-motions for summary judgment present two distinct tasks for the Court.

First, the Court must construe the disputed claim terms of the ’692 Patent. Defendants refer the Court to their summary judgment brief for their detailed *Phillips*-based analysis in support of their proposed claim constructions. *See* D.I. # 112, Def. Op. Br., Arg. § II. In this brief, Defendants respond to the arguments raised by Plaintiffs in support of their claim constructions. *See infra*, § I.

As explained below, Plaintiffs previously made statements that are inconsistent with their current arguments that the claims encompass pre-treating coal and injecting bromide compounds into the combustion zone. Indeed, during the patent reexamination appeal, Plaintiffs told the PTAB that the claims were limited to introducing chemicals well *after* the combustion zone:

To persons of ordinary skill in the art, “flue gas” means that region of combustion gases *from the upper furnace region* through the emissions control devices.

D.I. # 113, Def. PFF ¶ 235 (emphasis added). The Patent Owner underscored that the limited claim scope was “clear and consistent” with the prior art:

[T]he prior art is quite clear and consistent in its teaching that “flue gas” refers to combustion gases which reside in the “flue”—the region of a coal combustor from *above the combustion zone* through the particulate collection system.”

D.I. # 113, Def. PFF ¶ 239 (emphasis added). In allowing the claims, the PTAB held that the “broadest reasonable interpretation” of the claimed method of “injecting . . . into flue gas” was even narrower than what the Patent Owner proposed on appeal—and limited the claims to a process in which chemicals are “injected in several locations *between the boiler and the stack outlet*.” D.I. # 113, Def. PFF ¶ 265 (emphasis added). The PTAB thus excluded from the permitted injection sites not just the combustion zone, but the entire boiler—foreclosing Plaintiffs’ argument today that “injecting . . . into the flue gas” includes either pre-treatment, or injection into the combustion zone.

Plaintiffs struggle against these obstacles. They begin by taking the astonishing position that, after years of litigation, they have finally discovered that the patent claims themselves contain the very definition of “flue gas” that Plaintiffs seek. Plaintiffs then argue that because the most significant type of *Phillips* evidence, the claim language,

defines “flue gas,” that putative definition must control the Court’s interpretation, notwithstanding the patent’s narrow disclosure and the explicit statements made during prosecution. The only problem is that the patent claims provide ***no such definition***. And without that definition in the claims, Plaintiffs’ entire *Phillips* analysis collapses. As explained below, the remainder of Plaintiffs’ claim construction arguments rest on non-expert testimony about technical issues, inaccurate statements about other people’s patents, and misstatements about prior proceedings. When all of this is swept aside, it is clear that the correct claim constructions are not those that Plaintiffs now demand, but rather the reexamination positions they now disavow.

The second task before the Court, after construing the claims, is to determine whether Plaintiffs have met their burden of establishing entitlement to partial summary judgment. As discussed below, Plaintiffs have failed to meet that burden on any issue. They are not entitled to judgment of infringement because, among other things, their claim construction is entirely wrong, and in any event they have failed to offer undisputed facts to support a finding of infringement under any construction. And because under Plaintiffs’ claim construction their patent is directed to a natural process, they are not entitled to judgment dismissing Defendants’ Section 101 challenge.

Just as Plaintiffs cannot disavow the claim-scope positions they took to save their patent during reexamination, they cannot repudiate the positions they took in their business dealings prior to suit.

For example, as explained in Defendants’ motion for summary judgment, when Nalco’s air-protection team sought Chem-Mod’s help to break into the refined coal business that had eluded it, Nalco’s team leader assured Chem-Mod’s principal that the

'692 Patent was no cause for concern. That induced Chem-Mod to teach Nalco about the refined coal business, and to work with Nalco to market Chem-Mod's process to Nalco's customers, resulting in millions of dollars of revenue for Nalco. Later, Nalco lay in wait while two more of its customers—the power plant Defendants—adopted the use of refined coal at their facilities. Plaintiffs cannot disavow these prior statements and actions, and the Court should deny their request for summary judgment with respect to

██

Likewise, Plaintiffs cannot nullify the express license that they granted to practice the '692 Patent in order to go after infringement damages. Plaintiffs would have the Court ignore the plain language of the parties' agreement, and the parties' course of dealing, to excuse Nalco from the deal it made. Plaintiffs' request for summary judgment with respect to the contract claims should be denied.

Plaintiffs' arguments are rife with errors of law and with assertions of fact contradicted by the long historical record. Careful review of the evidence establishes that Plaintiffs' requests for summary judgment should be denied.

LEGAL STANDARD

Under *Celotex Corp. v. Catrett*, 477 U.S. 317, 323–24 (1986), a party seeking summary judgment bears the “initial responsibility of informing the district court of the basis for its motion,” and must identify those portions of the record it believes supports its position. To avoid summary judgment, the opposing party “must set forth specific facts showing that there is a genuine issue for trial.” *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). A genuine dispute of material fact exists if “the evidence is such that a reasonable jury could return a verdict for the nonmoving party.” *Id.* The Court on

summary judgment does not weigh evidence, but “must construe all facts and reasonable inferences in the light most favorable to the nonmoving party.” *Design Basics LLC v. J & V Roberts Investments, Inc.*, 130 F. Supp. 3d 1266, 1273 (E.D. Wis. 2015) (citing *CTL ex rel. Trebatoski v. Ashland Sch. Dist.*, 743 F.3d 524, 528 (7th Cir. 2014)).

ARGUMENT

I. Plaintiffs’ Claim Construction Arguments Flout *Phillips*, Misrepresent the Record, and Largely Depend on Attorney and Other Non-Expert Opinions.

Defendants’ opening brief in support of their Motion for Summary Judgment includes a detailed analysis of the disputed claim construction issues, organizing all of the relevant intrinsic evidence as set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005). Defendants respectfully refer the Court to that analysis as general support for the claim constructions proposed by Defendants. D.I. # 112, Def. Op. Br. 37–59. Instead of repeating those arguments, this opposition brief responds to the specific arguments that Plaintiffs raise in their motions. Sections I.A through I.D. below group Plaintiffs’ arguments according to the category of *Phillips* evidence to which they most closely pertain. Additional sections I.E. through I.G address evidentiary and legal problems that infect broad swaths of Plaintiffs’ analysis—including Plaintiffs’ extensive reliance on technical statements offered only through Plaintiffs’ attorneys, without the support of expert testimony.

For the Court’s reference, Plaintiffs’ proposed terms for construction and the parties’ proposed constructions of such terms are set forth in the following excerpt from the Parties’ Amended Joint Table of Terms Requiring Construction, submitted April 12, 2019:

Plaintiffs' Proposed Terms and the Parties' Proposed Constructions:

Claim Term	Plaintiffs' Proposed Construction	Defendants' Proposed Construction
"flue gas"	The gas produced during the combustion of coal.	The term "flue gas" should not be construed in isolation, but rather as it is used in the patent claims, where it occurs in the claim terms "coal combustion flue gas"; "said flue gas"; "the flue gas"; and "flue gas . . . wherein the flue gas is produced during the combustion of coal." Those terms should be given the construction: "The gases in the region from above the combustion zone through the stack outlet that result from the substantially-complete combustion of coal."
"injecting"	Introducing under pressure or by use of force.	The word "injecting" should not be construed in isolation, but rather as it is used in the patent claims, where it occurs in the claim terms "injecting . . . into said flue gas" and "injecting into the flue gas." Those terms should be given the construction: "injecting into the flue gas stream after the boiler and before the stack outlet."

D.I. # 88, Amended Joint Table of Terms Requiring Construction at 2.

A. Plaintiffs' Claim Construction Arguments Rely Heavily on the False Assertion That Claim 19 Contains a Definition of "Flue Gas."

Plaintiffs propose to cut off the claim construction analysis before it begins. They assert more than three dozen times that claim 19 of the '692 Patent contains a "definition" of "flue gas" that is "clear" and "express," and argue that under the hierarchy of evidence set forth in *Phillips*, this putative definition of "flue gas" should govern the Court's construction of that term "in all of the claims of the '692 Patent." See D.I. # 107, Pl. Op. Br. 31–36; *see also, e.g., id.* 25, 28–29, 38, 42, 45–46, 50–52, 56–58, 64, 69, 71, 78, 85–86.

This is an entirely new argument. It was not advanced during the reexamination or the reexamination appeal, not raised in Plaintiffs' expert reports, not briefed during the

extensive motion practice in the Chem-Mod Case, and not suggested to the Federal Circuit when Nalco sought to revive its case, which had been dismissed with prejudice for lack of a plausible theory of infringement. Here, however, after asserting that claim 19 defines “flue gas,” Plaintiffs would use that putative definition to avoid the effects of the bulk of the intrinsic evidence:

- “Where, as here, the meaning of a claim term is clear from the claims, then the review of other materials . . . is done only to determine if that clear meaning has been clearly rejected and changed in some way” (*id.* at 26);
- “In the case, which exists here, that the disputed term is defined in the claim itself, that construction controls unless there is clear and express disclaimer or disavowal” (*id.* at 31);
- “[T]he case law is that a clear definition of term provided in the claims, only can be set aside, if at all, by a clear contrary definition in the specification” (*id.* at 35–36);
- The Patent Owner’s statements before the PTAB were not an “abandon[ment of] his clear claim language” (*id.* at 46);
- “Defendants’ Attempt to Rely On Two Reexamination Statements Also Fails . . . To Meet The High Legal Bar For Setting Aside Clear Intrinsic Definitions In The Claims” (*id.* at 52); and
- “[E]ven if [Defendants’] proposed definition [of ‘injecting . . . into the flue gas’] were otherwise appropriate, it would be error here to use it to contradict the clear definition of ‘flue gas’ already provided in the claim” (*id.* 69).

There is, however, no “definition” of “flue gas” in claim 19. Claim 19 reads as follows:

19. A method of treating flue gas that contains elemental mercury, wherein the flue gas is produced during the combustion of coal, said method comprising the steps of:

(a) injecting into the flue gas a bromide compound that is a thermolabile molecular bromine precursor selected from the group consisting of calcium compounds and magnesium compounds, whereby the elemental mercury is oxidized to form mercuric bromide; and

(b) providing solid alkaline particles in said flue gas upstream of a particulate collection device, whereby at least a portion of the mercuric bromide produced at Step (a) is adsorbed by the solid alkaline particles.

D.I. # 108, Pl. PFF ¶ 175.

Plaintiffs enlist as claim 19’s purported “definition” of “flue gas” that portion of the claim stating that it is directed to a “method of treating flue gas that contains elemental mercury, *wherein the flue gas is produced during the combustion of coal.*”

D.I. # 113, Def. PFF ¶ 273 (citing D.I. # 38-1, ’692 Patent at 10, cl. 19 (emphasis added)). According to Plaintiffs, that bolded clause should control the claim construction because it is a “definition” of “flue gas” provided by the claim language itself. D.I. # 107, Pl. Op. Br. 31–33. It is not.

First, the clause identified by Plaintiffs is a claim ***limitation***, not a definition. It does not purport to say what “flue gas” means in the context of claim 19, or even what “flue gas” means at all. It simply specifies that the source of the flue gas that is the subject of the claimed method is the combustion of coal, as opposed to the combustion of other fuels or other substances that contain mercury. As such, it provides a limitation on the scope of the claims—a necessary one, in view of the ’692 Patent’s explicit citation of literature directed to reducing the mercury in flue gas from sources other than the

combustion of coal.¹ For example, the '692 Patent cites (at D.I. # 38-1, 2:16–25 and 9:18–20), the Amrhein '939 Patent, which states:

The present invention relates generally to the field of flue gas cleanup methods . . . and, in particular, to a method for removing mercury from the flue gas generated during the combustion of fossil fuels or solid wastes.

Def. Supp. PFF ¶¶ 945–946. The '692 Patent also cites (at D.I. # 38-1, 2:8–15) the

Biswas '217 Patent, which states:

This invention relates to preventing air emissions of heavy metal species . . . from a variety of different sources (e.g., combustion sources, coal combustion, incineration, chemical process industry and others).

D.I. # 113, Def. PFF ¶¶ 947–948. And the '692 Patent cites (at D.I. # 38-1, 10:10–12)

the Ide '882 Patent, which states:

This invention relates to a process for cleaning . . . municipal refuse incinerator emissions.

D.I. # 108, Pl. PFF ¶ 427. Moreover, the so-called “definition” in claim 19 is the *only* mention in claim 19 that the substance being combusted is *coal*. Thus, the “wherein” clause provides the important limitation that the flue gas must be flue gas produced from the combustion of coal, rather than from the combustion of other substances.

Second, Plaintiffs base their argument on a clause that is introduced by the word “wherein.” D.I. # 113, Def. PFF ¶ 273. But whether “wherein” sets off a limitation or a definition depends on the context. *See Griffin v. Bertina*, 285 F.3d 1029, 1033–34 (Fed. Cir. 2002) (holding that “wherein” is used to introduce a limitation on the claim except in

¹ Plaintiffs’ expert witness, Andrew Fry, admits that “‘flue gas’ in general would at the time [2002] have been understood to refer to the results of combustion of whatever substance is being combusted.” Def. Supp. PFF ¶ 935A.

rare instances); *Intergraph Hardware Techs. Co. v. Toshiba Corp.*, 508 F. Supp. 2d 752, 769 (N.D. Cal. 2007) (“wherein” clause either “expresses an inventive component or merely the result of the delineated limitations”). In the ’692 Patent, each other use of the word “wherein” in the patent’s claims indicates a further limitation, not a definition. *See, e.g.*, D.I. # 113, Def. PFF. ¶¶ 170–175 (citing D.I. # 38-1, ’692 Patent at 10, cl. 11 (“ . . . wherein the alkaline solid particles are those derived from the decomposition of the thermolabile molecular bromine precursor”); *id.* at 11, cl. 21 (“A method of treating flue gas . . . wherein the thermolabile molecular halogen precursor of Step (a) is a hypochlorite; wherein the hypochlorite is calcium hypochlorite; and wherein the calcium hypochlorite is in an aqueous solution containing calcium chloride”); *id.* at 11, cl. 26 (“The method of claim 19 wherein the alkaline solid particles provided at Step (b) are derived from flue gas desulphurization (FGD) solids.”); *id.* at 11, cl. 29 (“The method of claim 19 wherein the particulate collection device of Step (b) is chosen from the group consisting of . . . ”)).

Words should be read consistently among different claims. *See Phillips*, 415 F.3d at 1314 (“Because claim terms are normally used consistently throughout the patent, the usage of a term in one claim can often illuminate the meaning of the same term in other claims.”); *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342 (Fed. Cir. 2001) (“[A] claim term should be construed consistently with its appearance in other places in the same claim or in other claims of the same patent.”). To be consistent with the usage of “wherein” throughout the ’692 Patent, the patentee’s use of “wherein” in claim 19 should signify a limitation on the claim, not a definition.

Third, any definition of “flue gas” needs to function meaningfully in all ’692 Patent claims that include that term, because the same term used in different claims should be read consistently. *See Phillips*, 415 F.3d at 1314; *Rexnord*, 271 F.3d at 1342. Taking Claim 1, which separately uses the terms “coal combustion flue gas” and “flue gas,” as an example, Plaintiffs’ definition fails that test. Importing the proposed claim 19 definition of “flue gas” into the claim 1 terms creates nonsense. Claim 1, which is directed to “[a] method of treating coal combustion flue gas containing mercury,” would start by teaching that claim 1 is directed to “[a] method of treating coal combustion gas that is produced during the combustion of coal.” That would render at least one use of “coal combustion” superfluous in that statement, and claims should not be construed so as to render terms and words superfluous. *Digital-Vending Services Intern., LLC v. U. of Phoenix, Inc.*, 672 F.3d 1270, 1275 (Fed. Cir. 2012) (“In *Phillips*, this court reinforced the importance of construing claim terms in light of the surrounding claim language, such that words in a claim are not rendered superfluous In this case, the reference in some claims to a ‘registration server being further characterized in that it is free of content managed by the architecture’ strongly implies that the term ‘registration server,’ standing alone, does not inherently mean a server that is free of managed content.”); *see also Phillips*, 415 F.3d at 1314 (claim term “‘steel baffles’ . . . strongly implies that the term ‘baffles’ does not inherently mean objects made of steel”). In the alternative, Plaintiffs would simply have the words “flue”² or even “flue gas” disappear from the ’692 Patent altogether, and substitute “combustion gas” in as equivalent, but that does not

² Similarly, Plaintiffs’ proposed construction would render the word “flue” superfluous, also in violation of the canons of construction.

reflect the actual language of the claims—or even the “definition” purportedly provided by claim 19. At this point, it is sheer speculation to assert that this claim would have survived reexamination (or even issued in the first place) if it were directed to “coal combustion gas” unmodified by “flue,” or if it were directed to all gases “produced during the combustion of coal.”

Fourth, if the clause that Plaintiffs cite from claim 19 is made the “definition” of “flue gas,” it does nothing to define the scope of the claims. One of the key issues relating to patent invalidity and noninfringement in these cases is the meaning of the claim term “injecting into the flue gas,” as well as that element’s reference to “flue gas”—*viz.*, does the term “injecting into the flue gas,” as used in the patent claims, also include pre-treating coal ***and*** injecting into the combustion zone (the two other methods of introducing chemicals to coal-fired power plants)? *See* D.I. # 107, Pl. Op. Br. 28 (describing the dispute over “flue gas” as the “principal claim construction dispute between the parties”). To advance the disposition of these cases, the construction of the claims should address the disputed issue: the identity of the “flue gas” into which a thermolabile molecular bromine precursor must be injected according to the ’692 Patent claims. But Plaintiffs’ proposed use of the “definition” in claim 19 does not do so.

The parties already agree that the “flue gas” into which thermolabile molecular bromine precursors must be injected is gas derived from the combustion of coal, rather than from the combustion of another fuel or even the incineration of trash. But a claim construction that defines “flue gas” simply by stating what it derives from, without providing any information about its properties, its composition, or where it is found, or what may be “injected into” it, provides no meaningful guidance on any claim’s scope,

and substitutes two terms in need of construction (“flue gas” and “injecting into flue gas”) with several others—including “gas,” “produced,” and “combustion.”

The record contains many illustrations as to why Plaintiffs’ proposed construction would be unhelpful. For example, Plaintiffs’ expert witness, Andrew Fry, conceded that the gaseous mixture in a boiler would not be called “flue gas” before the convective zone; upstream of that zone, it is simply “a mixture of air and flue gas.” D.I. # 113, Def. PFF ¶¶ 132, 295, 298. Plaintiffs’ proposed construction—“gas produced by the combustion of coal”—does not reflect that important distinction, and accordingly, it provides no guidance on whether “injecting” into a gaseous mixture that contains both air *and* the combustion gases from the partial combustion of coal performs the step of “injecting into flue gas.”

Likewise, the proposed definition’s reference simply to the “combustion of coal” does not provide guidance as to what constitutes the “combustion of coal.” For example, for a furnace that uses staged combustion, the construction is agnostic as to whether “combustion” refers to the “combustion” that is substantially complete only after the introduction of overfired air, or the initial, partial combustion that occurs prior to the overfired air, *see* D.I. # 113, Def. PFF ¶¶ 119–125 (describing function of overfired-air boilers), or whether combustion can include the mere volatilization of compounds that occurs when the coal is heated. D.I. # 77, Fry Dep. 124:1–19.

Plaintiffs’ definition fails even to resolve whether “flue gas” ceases to be “flue gas” after it leaves the smoke stack. If coal combustion flue gas is simply “gas produced during the combustion of coal,” then it is that thing forever and always. Even if it exits a smoke stack and mixes with the atmosphere, its derivation can never be denied, as shown

by the inability of Plaintiffs' expert witness, Dr. Fry, to identify when flue gas leaving the smokestack stops being "flue gas." D.I. # 113, Def. PFF ¶ 153. As a consequence, under Plaintiffs' proposed "gas produced by" definition, there is flue gas potentially awaiting injection literally *everywhere*, from all coal that has been burned. *See e.g., MagSil Corp. v. Hitachi Glob. Storage Techs., Inc.*, 687 F.3d 1377, 1381 (Fed. Cir. 2012) (claim not enabled where "broad construction" entirely eliminated upper bound of claim).

In sum, not only is there no definition of "flue gas" in claim 19, but the limitation that Plaintiffs' propose as the putative definition for "flue gas" is not useful to define the scope and meaning of the claims. Yet that is the whole point of claim construction. *See O2 Micro Intern. Ltd. v. Beyond Innovation Tech. Co., Ltd.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement.") (quoting *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997)).

By contrast, Defendants' proposed construction of "flue gas" avoids the problems manifest in Plaintiffs' proposed construction. Defendants have focused on the term "injecting into the flue gas" as a meaningful and operable term, and on how a POSA would understand the term "flue gas" in the context of a patent claim directed to the method of "injecting" a chemical "into the flue gas." As explained in Defendants' opening brief, a POSA would recognize the well-known method of "injecting . . . into the flue gas," and know that it is typically performed after the boiler and before the stack outlet. *See* D.I. # 112, Def. Op. Br. 40, 52.

Defendants’ construction also is consistent with the concession of Plaintiffs’ own expert witness that a POSA would not refer to the gases in the lower furnace or combustion zone as “flue gas,” but rather as flue gas *and* air—and that such a POSA would refer to the gases in the convective section and flue gas ductwork as fully “flue gas.” D.I. # 113, Def. PFF ¶¶ 120, 129, 132, 294, 297. And it is consistent with the concession of Plaintiffs’ own expert witness that a POSA would have recognized three methods for introducing chemicals into a coal-fired power plant—only one of which is “injecting . . . into flue gas,” the term used in the claims. PFF ¶¶ 154–157, 307; *see also* PFF ¶ 301 (Defendants’ expert witness).

B. Plaintiffs’ Arguments Based on the Specification Are Wrong.

1. Plaintiffs’ Straw-Man Argument About the Chemistry and Temperature Statements in the Specification Ignores the Actual Intrinsic Evidence That the Specification Provides.

“[T]he specification ‘is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.’” *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). As explained in more detail in Defendants’ opening brief, D.I. # 112, Def. Op. Br. 44–47, the specification of the ’692 Patent includes a significant statement about the ’692 Patent’s use of the term “flue gas.” In particular, the ’692 Patent teaches that in “coal combustor flue gas”³—as that term is used in the Patent—certain listed chemicals have “negative values for the free energy of formation.” D.I. # 113, Def. PFF ¶ 194 (D.I. # 38-1, ’692 Patent at 4:66–5:6) (“The conversion of mercury

³ Plaintiffs’ expert witness, Andrew Fry, agrees that the terms “coal combustor flue gas” and “coal combustion flue gas,” as used in the ’692 Patent, have the same meaning. D.I. # 113, Def. PFF ¶ 193.

to its mercuric halide forms is thermodynamically favoured at temperatures typical of coal combustor flue gas . . . as indicated by the negative values for the free energy of formation of mercuric halides . . . as shown in the table 2 below.”). Those chemicals, however, do *not* have negative free energies of formation in the combustion zone of a coal-burning power plant, because that zone is too hot. D.I. # 113, Def. PFF ¶ 195 (D.I. # 77, Fry Dep. 194:20–25; D.I. # 81, First Wilcox Report ¶¶ 68, 110; D.I. # 82, Second Wilcox Report ¶¶ 22–23). A POSA would therefore infer from the Patent’s statement regarding “*negative* values for the free energy of formation” that the patentee did not consider the combustion zone (or other similarly hot regions of the boiler) to contain “flue gas” as the patentee used that term. D.I. # 113, Def. PFF ¶¶ 195–196 (D.I. # 81, First Wilcox Report ¶ 110; D.I. # 82, Second Wilcox Report ¶¶ 22–23); Def. Supp. PFF ¶ 935B (D.I. # 81, First Wilcox Report ¶ 68).

Plaintiffs do not directly address this important statement in the Specification. Instead, Plaintiffs focus on an entirely *different* argument, which was made during the reexamination appeal but which Defendants do not advance here. *See* D.I. # 107, Pl. Op. Br. 45–46. During that appeal, the challenger focused on the fact that Table 2 of the ‘692 Patent only provides the free energies of formation for three mercuric halide compounds at each of five discrete temperatures: 127 °C, 227 °C, 327 °C, 427 °C, and 527 °C. D.I. # 108, Pl. PFF ¶ 242; D.I. # 113, Def. PFF ¶¶ 195, 233 (D.I. # 38-1, ‘692 Patent at 4:66–5:28; D.I. # 38-9, Alstom’s Brief (Nov. 21, 2012), at 268). The challenger suggested that the patent claims, including the term “thermolabile” used in those claims, are limited to that range of enumerated temperatures—*i.e.*, from 127 °C to 527 °C. D.I. # 113, Def. PFF ¶ 233 (D.I. # 38-9, Alstom’s Brief (Nov. 21, 2012), at 268). That argument, which

the PTAB rejected on appeal, D.I. # 113, Def. PFF ¶¶ 259–260, 262–263 (D.I. # 38-10, Decision on Appeal (Dec. 12, 2013), at 365–370), is *not* an argument Defendants make here. Nor do Defendants argue that this teaching in the '692 Patent—that it is “[c]lear from table 2” that the reaction to form mercuric chloride “is particularly favoured between 127 and 527°C, typical of post-superheater coal combustor flue gas zones”; D.I. # 113, Def. PFF ¶ 194; D.I. # 108, Pl. PFF ¶ 209 (D.I. # 38-1, '692 Patent at 5:21–25)—reads an upper temperature limit into the claim.

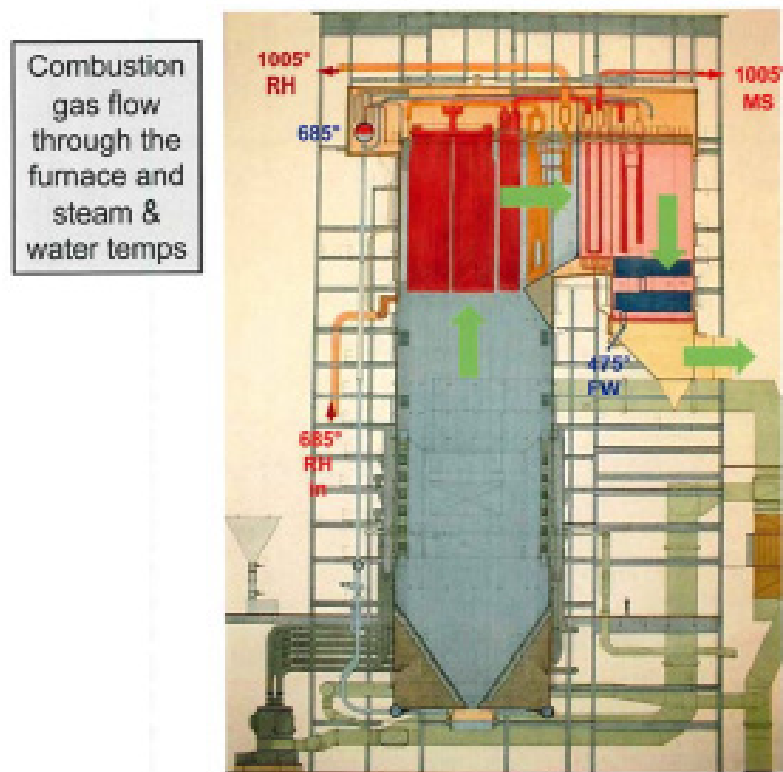
Instead, Defendants focus only on the fact that the specification informs a POSA about a distinguishing characteristic of the “coal combustion flue gas” that is the object of the Patent’s claimed method. D.I. # 112, Def. Op. Br. 45–47. A POSA having the requisite level of training in chemistry would immediately understand the statements in the '692 Patent about “negative values for the free energy of formation” to provide evidence regarding what the patentee means by “flue gas,” and not a definition of “flue gas.” D.I. # 113, Def. PFF ¶¶ 195–196; D.I. # 81, First Wilcox Report ¶ 68, D.I. # 82, Second Wilcox Report ¶ 23. These teachings constitute part of the intrinsic record and inform the meaning of “flue gas” as used in the patent claims.

2. Plaintiffs Improperly Direct Their Claim Construction Arguments to the Purported Plans of the Accused Power Plants, and Then Rely on Unsworn and Inexpert Attorney Statements About Power Plant Technology.

Plaintiffs funnel their analysis of the specification through design and operational characteristics of the accused power plants. The details of the accused products and processes, however, do not define the meaning of disputed patent claim terms. *SRI International v. Matsushita*, 775 F.2d 1107 (Fed. Cir. 1985) (“A claim is construed in the light of the claim language, the other claims, the prior art, the prosecution history, and the

specification, *not* in light of the accused device” (emphasis in original)). Yet Plaintiffs use diagrams of the configuration and operation of the accused power plant units as their vehicle to explain how the claim elements purportedly interact and thereby to affect their interpretation. Plaintiffs then compound the effect of their misdirection by mischaracterizing the diagrams they rely on.

For example, Plaintiffs’ summary judgment brief reproduces (at page 9) the diagram of a furnace contained in a Columbia power plant presentation:

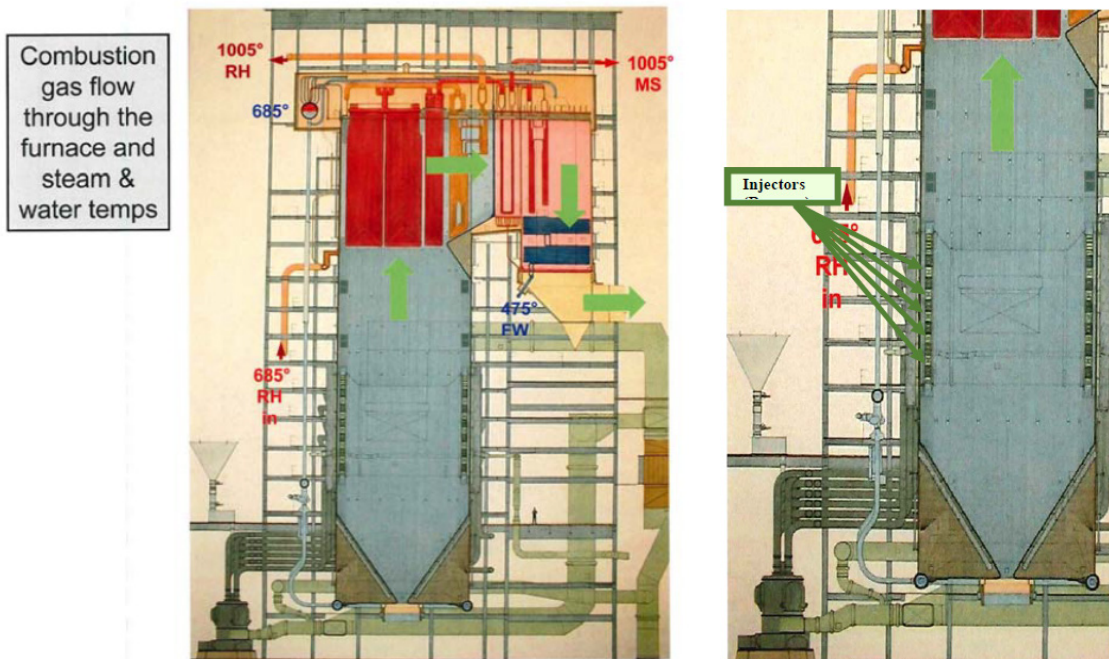


D.I. # 107, Pl. Op. Br. 9. The diagram includes a caption that reads: “Combustion gas flow through the furnace and steam and water temps.” *Id.* The diagram reproduced also contains green arrows, which—according to that caption—depict the “[c]ombustion gas flow.” *Id.* Yet the description of the reproduction of the diagram at page 9 of Plaintiffs’ brief (as well as Plaintiffs’ PFF ¶¶ 70–72), which also

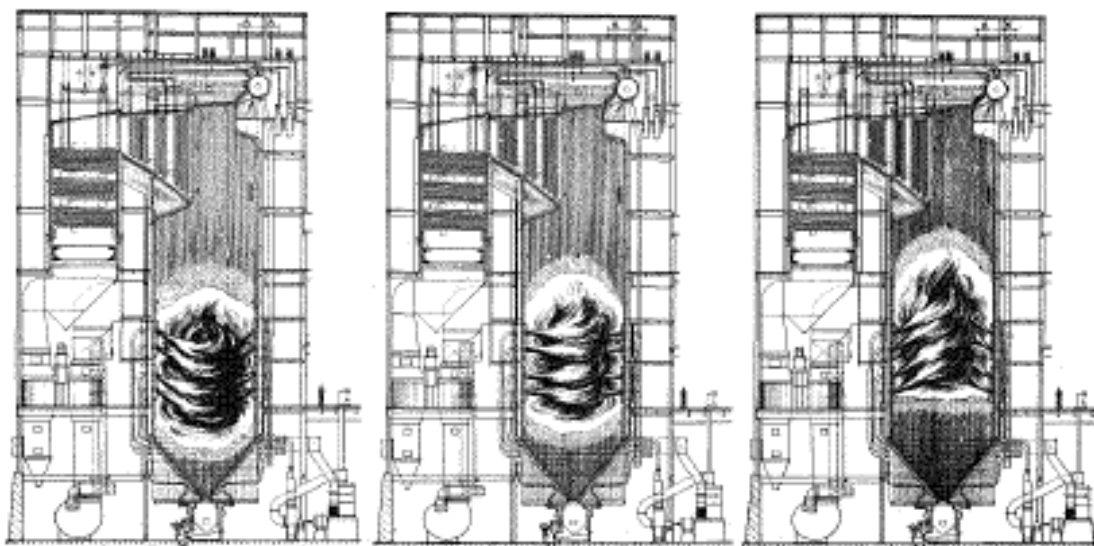
reproduce the diagram and which Plaintiffs also cite in their brief at 9), states that the diagram “depicts this *flue gas flow* in the accused boiler, with the *flow of the flue gas* depicted by green arrow” (emphases added). D.I. # 107, Pl. Op. Br. 9; D.I. # 108, Pl. PFF ¶¶ 70–72. But the Columbia power plant diagram itself uses the term “Combustion gas flow”—not “flue gas flow.” *Id.* Thus, the suggestion that this document or its green arrows reflect “flue gas” terminology is Plaintiffs’ creation, with no supporting citation from any fact or expert witness.

Putting Plaintiffs’ wishful mischaracterization of the diagram to one side, the diagram would be of minor materiality at best to claim construction even if it actually did use the term “flue gas flow.” But because the diagram uses a *different* term than “flue gas” to describe the combustion gases in the furnace, it undercuts Plaintiffs’ attempt to use it as proof that POSAs describe the gases in the furnace as “flue gas.” D.I. # 107, Pl. Op. Br. 9.

Plaintiffs similarly rely on unsponsored “expert” opinions that purportedly concern the accused Weston unit. *See* D.I. # 107, Pl. Op. Br. at 16–17; D.I. # 108, Pl. PFF ¶ 105. With respect to that Weston unit, Plaintiffs (i) used this same PowerPoint slide reproduced above, which is from a *Columbia* presentation, to make assertions about the Weston plant, D.I. # 108, Pl. PFF ¶ 70; (ii) appear to use testimony from the Columbia plant manager, Jerald Lokenvitz, to characterize the Weston plant, D.I. # 108, Pl. PFF ¶ 71; (iii) apply their own “Injectors” label and arrows to an exhibit used at Mr. Lokenvitz’s deposition, D.I. # 108, Pl. PFF ¶ 105; and (iv) misidentify the number and location of the furnace parts indicated by the supplied arrows, *id.*



Plaintiffs also reference a black-and-white drawing from a Weston plant manual in support of their proposed construction of the claim term “flue gas”:



Three views of a tangentially fired furnace showing nozzle tilt 30 degrees downward, horizontal and 30 degrees upward.

D.I. # 107, Pl. Op. Br. 68; *see also* D.I. # 107, 28–29 n.12 (reproducing portion of sketch of boiler). [REDACTED]

[REDACTED]⁴ purports to show how the combustion zone in a furnace can be positioned by adjusting the angle of certain nozzles. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] However described, the drawings have no legend indicating what the shading or cross-hatching or stippling in the furnace represents. *Id.* There is no statement regarding how such shading or lines may relate to or purport to indicate the density of gases or other materials, the temperature of gases or other materials, the constitution of gases or other materials, or whether and to what extent any combustion is taking place. *Id.* There is no statement or indication or depiction of whether the combustion involves overfired air or is otherwise staged. *Id.* The drawing is, indeed, a cartoon without any particulars of engineering or performance specifications. Plaintiffs, however, purport to fill in this missing information with attorney argument that the drawings depict where “flue gas” begins.⁵ D.I. # 107, Pl. Op. Br. 12–13. In so doing, Plaintiffs ignore that Defendants’

⁴ In her deposition, Dr. Wilcox testified as follows about this page: “Q. So here’s my question. Comparing the figure on the left and the figure on the right, would you say what you would call the furnace is different in those two pictures or is it the same? A. I think that the furnace is the region where the combustion is taking place. I don’t—even though these half circles are kind of different heights, I would have to—I mean, in this one you still don’t really know. This doesn’t—it’s a cartoon so it’s not giving you the exact temperature gradient.” Def. Supp. PFF ¶ 937 (D.I. # 74, Wilcox Dep. 78:12–23).

⁵ Plaintiffs also reproduce one portion of the same diagram on page 12 of their Brief. Plaintiffs state: “[a]n illustration of what happens inside the furnace portion of Weston’s boiler is shown in the manual for Defendant Weston’s boiler, shown on the left below.” D.I. # 107, Pl. Op. Br. 12, citing D.I. # 108, Pl. PFF ¶ 90. Pl. PFF ¶ 90, in turn, simply states “An illustration of what happens inside the furnace portion is shown in the figure below,” citing only the page from the manual that contains the drawing. The illustration

definition of “flue gas” takes into account the extent of combustion, D.I. # 112, Def. Op. Br. 40; D.I. # 113, Def. PFF ¶¶ 289–290, and therefore is affected by the use of “overfired air,” D.I. # 113, Def. PFF ¶¶ 123, 125, 842, 849, 858, and that the “cartoons” do not indicate whether any such factors were considered or reflected in their preparation, Def. Supp. PFF ¶ 937. Attempting to create some evidence, Plaintiffs cite the refusal of Defendants’ expert witness, Jennifer Wilcox, to answer what exactly these drawings depict as ostensible proof that she could not support her own definition of flue gas. D.I. # 108, Pl. PFF ¶ 410 (D.I. # 74, Wilcox Dep. 128:14–129:10; 321:1–331:4). If anything, her recognition that the document is irrelevant to the task of construing the term “flue gas” in the patent displays her sophisticated understanding of the issues. But an unlabeled, non-technical drawing from the manufacturer of an accused plant, and which comprises no part of the intrinsic record, certainly does not support Plaintiffs’ position on claim construction.

3. Plaintiffs Predicate Many of Their Claim Construction Arguments on One Or Two Representations of a Purportedly “Typical” Power Plant—and Then Rely on Misstatements and Unsworn and Inexpert Attorney Statements About Those Plants as a Basis for Plaintiffs’ Claim Construction.

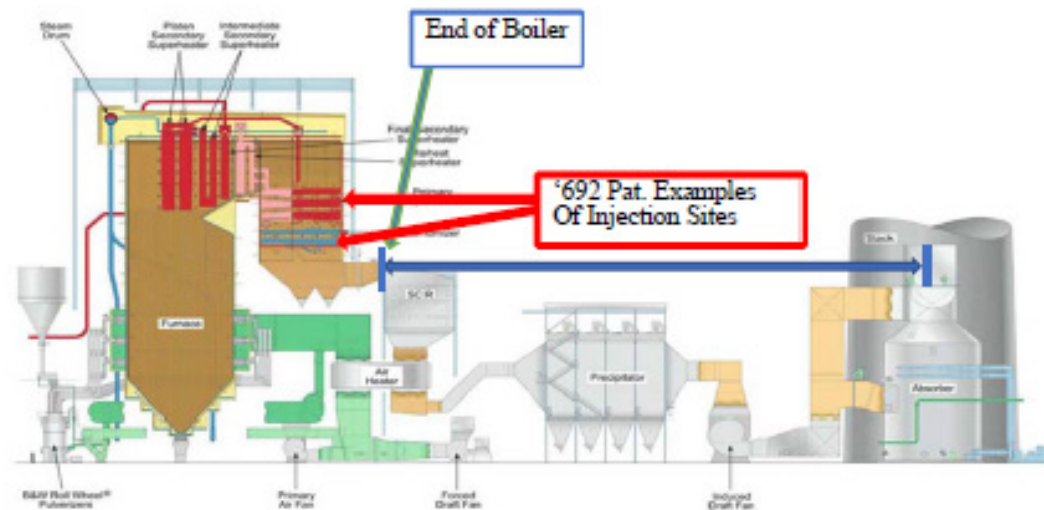
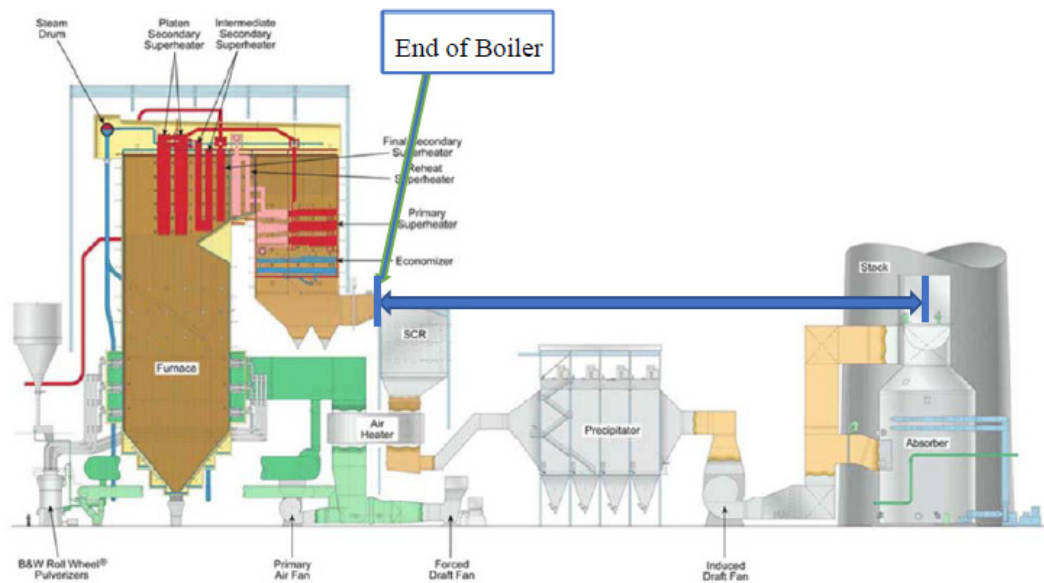
Plaintiffs also tether their analysis of the specification to one or two drawings of “typical” power plants that the parties’ expert witnesses provided to explain the relevant technology of the case. D.I. # 107, Pl. Op. Br. 5, 6 (excerpting diagram from page 5), 8 (repeating diagram from page 5, with expert-added markings and arrows), 11, 30 (repeating diagram from page 11, with attorney-added arrows and label), 37, 70

appears again at footnote 12 on page 29 of Plaintiffs’ brief, with similar characterizations, citing back to an earlier section of the brief. D.I. # 107, Pl. Op. Br. 29 n.12.

(repeating diagram from page 11 twice, with different sets of attorney-added arrows and labels). For the “evidence” as to how these drawings support their proposed claim constructions, however, Plaintiffs rely on their attorney interpretation of the diagrams, rather than fact witnesses or expert opinion evidence.

Moreover, because these drawings depict only a configuration of a “typical” power plant, Plaintiffs’ use of the drawings narrows the scope of the claim terms by funneling them through the happenstance of the specific configurations of those tutorial sketches—rather than through the full scope of power plant configurations that would be covered by the use of the claimed process. *See, e.g.*, D.I. # 107, Pl. Op. Br. 36 n.15 (“Note that other configurations of boiler can be possible . . .”).

For example, Plaintiffs repeatedly disparage Defendants’ proposed claim construction on the ground that it would purportedly exclude the preferred embodiments disclosed in the Specification—*i.e.*, injecting “after the superheater section” and “in the economizer/ESP [section] of the combustor.” *Id.* 36–38, 69–71; *see also* D.I. # 113, Def. PFF ¶¶ 170–175, 191 (D.I. # 38-1, ’692 Patent at 3:66–4:2 (“According to the invention, there is provided a method of treating coal combustion flue gas, preferably that obtained after the ‘superheater’ section of a coal-fired plant, for example the economizer inlet”)). Plaintiffs are wrong, relying on their own incorrect indications on the drawing—itsself supported by nothing more than a statement in the brief—as to (i) where a boiler ends (D.I. # 107, Pl. Op. Br. 30, 70); (ii) what constitutes “after the superheater section” (*id.* 37); and (iii) where the “economizer/ESP section” is (*id.* 70–71).



Attorney argument is not competent expert evidence on the location of those various regions and parts and no evidence is cited to support these arguments or the statements about these locations relative to each other or relative to more than just the “typical” diagram. Indeed, Plaintiffs acknowledge that “other configurations of boiler can be possible,” *id.* 36 n.15, but provide no support whatsoever for their conclusory

statement that in such configurations “the superheater section ends sooner in the boiler, and thus the area ‘preferred’ by the ’692 Patent specification would be larger.” *Id.* Supported solely by attorney declaration, these diagrams lack any probative value and the argument should be disregarded. Moreover, the labels and statements provided by Plaintiffs’ lawyers are demonstrably incorrect.

First, Plaintiffs’ expert witness, Andrew Fry, admits that each of the terms “boiler,” “furnace,” and “combustor” can be used in different ways. D.I. # 113, Def. PFF ¶ 115. Plaintiffs’ lawyers, in authoring their “PFFs,” have no authority to assign the “end” of the boiler on a particular diagram, let alone as a generality. Indeed, in doing so, they did not even account for the different endpoints shown in their own PFF ¶ 130, which indicates two Boiler regions (one labeled “**Boiler** (Lower Furnace)” and the other labeled “**Boiler** (Upper Furnace)”), and then a separate region simply labeled “**Economizer**.” D.I. # 108, Pl. PFF ¶ 130 (emphases in original). Plainly, in *that* diagram, the “end” of the “Boiler” would be before the “Economizer,” not after it—allowing for injection into the flue gas at that “preferred” injection site. *See also* D.I. # 107, Pl. Op. Br. 36–38 (providing uncited, conclusory discussion of boiler diagram purporting to identify whether the economizer is within the boiler).

Second, another “preferred” injection site referenced in the Patent and in Plaintiffs’ brief is “after the superheater section.” At page 70 of their brief, however, Plaintiffs draw an arrow placing that embodiment *inside* one section of superheaters. But “after” means “after”—not in. *See id.* 36–37 (stating, without citation, that in one figure of a boiler, “the area after all of the superheaters . . . would be just below the primary superheater and continuing on through the boiler.”).

Third, the other “preferred” injection site referenced in the Patent and in Plaintiffs’ brief is the “economizer/ESP [electrostatic precipitator] . . . of the combustor.” *Id.* 36–37, 70–71; D.I. # 113, Def. PFF ¶¶ 170–175, 191–192 (D.I. # 38-1, ’692 Patent at 7:60–65 (“It is certain that injection of a molecular halogen source . . . in the economizer/ESP section of this combustor . . . would effect substantial conversion of elemental mercury to easily adsorbable mercuric halide.”)). Once again, Plaintiffs purport to locate this area, but do so without expert assistance, and opt to place their arrow at the economizer. *See* D.I. # 107, Pl. Op. Br. 70. That placement choice has problems:

- (i) Plaintiffs assert that the economizer in that diagram is within the boiler (and therefore not after the boiler’s “end” that they drew), even though they elsewhere argue that the boiler is used to heat *steam* (D.I. # 107, Pl. Op. Br. 7; D.I. # 108, Pl. PFF ¶¶ 37–39), while the economizer performs the different function of heating *water* (D.I. # 113, Def. PFF ¶ 133; *see also* Def. Supp. PFF ¶ 934), excluding the economizer from their own definition of “boiler”;
- (ii) The region indicated in the Patent is the “economizer/ESP,” yet Plaintiffs ignore the “Precipitator” in the diagram that is significantly downstream of even the “End of Boiler” indicated by Plaintiffs’ arrows;
- (iii) In other statements, Plaintiffs’ own expert witness places the ESP *after* the boiler (D.I. # 113, Def. PFF ¶ 136); and
- (iv) the PTAB appeal decision places “injecting” as “between the boiler and the stack outlet,” D.I. # 108, Pl. PFF ¶ 231, which would necessarily exclude the economizer if the economizer were always *inside* the boiler. *See also* D.I. # 107, Pl. Op. Br. 37 (characterizing, without citation, location of economizer).

In short, Plaintiffs rely on pure argument relating to a few generic diagrams for the proposition that Defendants’ proposed claim constructions do not include the preferred embodiment. D.I. # 107, Pl. Op. Br. 37, 70–71. Their opinions are not only

incompetent—they are also wrong, and contradicted by the record. D.I. # 108, Pl. PFF ¶ 413; D.I. # 113, Def. PFF ¶¶ 133–136.

Despite Plaintiffs’ focus on the “typical” diagrams where they believe such focus suits them, Plaintiffs also advance arguments that are facially inconsistent with their own diagrams. For example, in a clumsy attempt at a “gotcha,” Plaintiffs assert that “flue gas” must include gases found *upstream* of the superheaters because the ’692 Patent includes a reference to “‘post-superheater’ flue gas.” D.I. # 107, Pl. Op. Br.39–40; D.I. # 108, Pl. PFF ¶ 209 (D.I. # 38-1, ’692 Patent at 4:66–5:18). To Plaintiffs, a reference to “post-superheater flue gas” necessarily implies that there is “*pre*-superheater” flue gas—*i.e.*, flue gas upstream from the superheaters. D.I. # 107, Pl. Op. Br. 40. That argument makes no sense. First, there is no indication that “post-superheater” is intended to signify that there are other types of flue gas. Second, even if, as Plaintiffs contend, it was intended to distinguish the flue gas that is “post-superheater” from some other type of flue gas, the only inference that could be drawn is that such other flue gas is not “post-superheater.” D.I. # 107, Pl. Op. Br. 40. That does not necessarily mean there is flue gas *before* the superheater, however, because as Plaintiffs’ own diagram shows, there are *multiple* superheaters spanning multiple regions of the boiler. D.I. # 107, Pl. Op. Br. 36–37. Accordingly, the reference to “post-superheater flue gas” does not suggest that there is “pre-superheater” flue gas. With reference to Plaintiffs’ own diagrams, such “flue gas” that is not *after* the superheaters could be in the upper furnace region, the convective crossing, and continuing downstream. There is nothing about something existing “post” a point in a pathway that implies the same thing exists “pre” that point.

Plaintiffs assert that the '692 Patent claims are directed to a process of broad applicability. D.I. # 107, Pl. Op. Br. 55–56, 63, 72. Yet where it suits them, they use one or two specific diagrams, supported by attorney argument, as a way to suggest that Defendants' claim construction is unduly limiting. Those arguments not only lack the support of competent evidence—let alone intrinsic evidence—but they are also incorrect. Plaintiffs cannot cite any case standing for the proposition that the claim construction must allow the preferred embodiment to be practiced in every real-world application covered by the claims. D.I. # 107, Pl. Op. Br. 73, D.I. # 108, Pl. PFF ¶¶ 417–418. Of all the types of coal-fired power plants where the claimed process may potentially be used,⁶ Plaintiffs chose diagrams of one type of system. They provided no evidence that the configuration shown in that diagram was not merely typical but universal (and indeed acknowledge that “other configurations of boiler can be possible,” D.I. # 107, Pl. Op. Br. 36 n.15), or any evidence that the configuration represents the full scope of configurations to which the claimed process is directed. The fact that Plaintiffs then, through their lawyers, incorrectly and arbitrarily labeled diagrams to suggest that Defendants' claim construction excludes a preferred embodiment is simply of no moment.

⁶ Plaintiffs' expert witness, Andrew Fry, identified five distinct types of coal-fired boilers, including tangential-fired boilers, wall-fired boilers, cyclone boilers, fluidized bed boilers, and arch-fired boilers, noting that “their operation can vary significantly.” D.I. # 113, Def. PFF ¶¶ 111–114.

4. Plaintiffs’ Claim Construction Analysis Ignores the Silence of the ’692 Patent Specification With Regard to Pre-treating Coal or Injecting Chemicals Into the Combustion Zone.

Plaintiffs’ claim construction analysis is also deficient because it fails to address a prominent feature of the intrinsic record: there is no teaching or discussion of applying a “thermolabile molecular bromine precursor” to coal before it is combusted, or to introducing such bromide compounds into the combustion zone. D.I. # 113, Def. PFF ¶ 210; Def. Supp. PFF ¶ 949.

This failure—in view of the ’692 Patent’s repeated discussion and mention of “injecting into flue gas”—is strong evidence that the inventor only intended to direct his claims to the third of the three methods for introducing chemicals into a coal-burning power plant. As explained in Defendants’ opening brief in support of their motion for summary judgment, a POSA reviewing the ’692 Patent specification would have expected there to be a discussion of which of the three methods of introducing materials were compatible with the claimed invention. D.I. # 112, Def. Op. Br. 43–44, 52; D.I. # 113, Def. PFF ¶ 162 (D.I. # 82, Second Wilcox Report ¶¶ 55–57). But there is no discussion in the Specification of either pre-treating coal or injecting into the combustion zone in the ’692 Patent, as Plaintiffs’ expert witness admitted. D.I. # 113, Def. PFF ¶¶ 189–190, 210; Def. Supp. PFF ¶ 949. Nor do Plaintiffs point to a single statement in the long reexamination history suggesting that Oehr sought to cover these other methods or regarded them as encompassed within “injecting into the flue gas.” *See generally* D.I. # 107, Pl. Op. Br. 45–52.

Indeed, if anything, the extrinsic evidence cited by Plaintiffs in their brief highlights these omissions. For example, as explained below, *see infra* § 1.D.1–2, not only do the Madden patents carefully delineate between “injecting into flue gas” and

other methods of adding chemicals, and distinguish between specific methods and general statements about adding chemicals, but they also provide information about which methods can be used to introduce the chemicals that are the subject of her patents. For example, the '288 Patent specifies “injecting into an upper portion of a furnace,” and cautions that “[i]njection at higher temperatures”—as would be found in the combustion zone—“causes ‘dead burning’, which decreases sorbent reactivity.” Def. Supp. PFF ¶ 943 (Klingman Decl. Ex. 34, '288 Patent at 1:66). Likewise, “[i]njection at lower temperatures”—such as into the flue gas ductwork—“inhibits calcination which also reduces sorbent reactivity. Def. Supp. PFF ¶ 943 (Klingman Decl. Ex. 34, '288 Patent at 1:67–2:2).

Plaintiffs’ lone suggestion that the '692 Patent specification alludes to methods other than “injecting into the flue gas” derives from one sentence in the '692 Patent that lists three types of modifications that can be made when introducing the material into flue gas. D.I. # 107, Pl. Op. Br. 72; D.I. # 108, Pl. PFF ¶ 416, citing D.I. # 38-1, '692 Patent at 6:40–43. Those three modifications relate to the droplet size, the concentration of the thermolabile molecular bromine precursor, and the overall amount (dose) of the thermolabile molecular bromine precursor. D.I. # 103, Pl. PFF ¶ 416. There is no mention of varying the site of the injection, however, from post-combustion to pre-combustion.

According to an uncited statement by Plaintiffs’ expert witness, it is more likely that an operator would vary concentration and dosing levels when moving to a different site for introducing chemicals. D.I. # 107, Pl. Op. Br. 74; D.I. # 108, Pl. PFF ¶ 417 (D.I. # 80, Third Fry Report ¶ 61). This argument—which has no legal support, *see* D.I. # 107,

Pl. Op. Br. 74—does not come anywhere close to establishing that the specification suggests that a POSA should introduce a thermolabile molecular bromine precursor into the combustion zone, or apply it to coal.

First, Dr. Fry does not opine that an operator would not consider varying these three factors at a particular injection point, only that, in his opinion, such factors are “primarily” evaluated when different injection points are considered. D.I. # 103, Pl. PFF ¶ 417. But POSAs also consider these factors any time they inject a compound into flowing gas. D.I. # 108, Def. PFF ¶¶ 418–442 (citing D.I. # 90, Mark Decl. Ex. 186, Julien at 1658 (discussing various concentrations and feed rates of HCl and CaBr₂ additions), see also Scherer at 5:31–7:1 (discussing methods of adjusting overall feed rate of halogens to gas)).

Second, Dr. Fry suggests only that these factors would be varied when considering a different “injection site,” D.I. # 103, Pl. PFF ¶ 417, but even when introducing a chemical by the method of “injecting . . . into the flue gas” disclosed in the patent, there are multiple possible sites for injection spread across the flue gas ductwork. D.I. # 113, Def. PFF ¶¶ 186, 191, 303.

Third, Dr. Fry seems to be comparing the extent to which these factors would be varied across different injection points within a plant, on the one hand, with the extent that these factors would be varied at one injection point in a plant, on the other hand. D.I. # 108, Pl. PFF ¶ 417 (D.I. # 80, Third Fry Report ¶ 61). But Dr. Fry should be considering that the patented method would need to be applied across multiple different types of coal combustion systems burning various coals (with varying concentrations of mercury and halogens) and using a variety of thermolabile molecular bromine precursors.

When considering the application of the patented method in such different contexts, the droplet size, concentration and total dose would require variation, and the '692 Patent offers no teaching or suggestion for a POSA on what droplet size, concentration, or overall dose a POSA should use for any particular thermolabile molecular bromine precursor or combustion system. D.I. # 113, Def. PFF ¶¶ 190–192. If anything, the fact that the '692 Patent lists only the three variations (*i.e.*, droplet size, concentration and dose), but fails to even mention the entirely different methods of pre-treatment or of injection into the combustion zone, suggests that Oehr did not consider that method to be part of his invention—and a POSA would not understand it to be.

C. Plaintiffs Cannot Overcome the Fact That Their Claim Constructions Conflict With the Prosecution History.

During the appeal from the reexamination decision, the Patent Owner made two simple, unambiguous statements regarding the meaning of “flue gas.” Each statement unambiguously advocated for a meaning of the term “flue gas” that is much narrower than what Plaintiffs seek in these cases. First, the Patent Owner stated:

“To persons of ordinary skill in the art, ‘flue gas’ means that region of combustion gases *from the upper furnace region* through the emissions control devices.” (emphasis added)

D.I. # 113, Def. PFF ¶ 234. Next, the Patent Owner underscored that this narrow scope was “clear and consistent” with the prior art:

“the prior art is quite clear and consistent in its teaching that ‘flue gas’ refers to combustion gases which reside in the ‘flue’—the region of a coal combustor from *above the combustion zone* through the particulate collection system.” (emphasis added)

D.I. # 113, Def. PFF ¶ 239. These two statements are part of the intrinsic record, and highly relevant to how a POSA would understand the meaning of “flue gas” in the claims of the

'692 Patent. Accordingly, Plaintiffs devote considerable effort to vitiating their impact. But each of Plaintiffs' arguments misses the mark by a wide margin.

1. Plaintiffs Mischaracterize Defendants' Citation to Hazelmere's Statements on Appeal as Seeking a Prosecution Disclaimer, Which Purportedly Sets a High Bar That Cannot Be Met. They Are Wrong on All Counts.

First, Plaintiffs impute to Defendants an argument not made here. Specifically, Plaintiffs argue that the Patent Owner's explanations of claim terms to secure allowance of the claims should not be given effect because they do not meet the requirements of a prosecution disclaimer. D.I. # 107, Pl. Op. Br. 52–55. But Defendants have not asserted that the doctrine of prosecution disclaimer applies here. Defendants argue only that the Patent Owner's express definition of the precise claim term under consideration is entitled to considerable weight, a proposition that finds strong support in the case law. *See Microsoft Corp. v. Multi-Tech Sys.*, 357 F.3d 1340, 1350 (Fed. Cir. 2004) ("We have stated on numerous occasions that a patentee's statements during prosecution, whether relied on by the examiner or not, are relevant to claim interpretation."); *Seachange Intern., Inc. v. C-COR, Inc.*, 413 F.3d 1361, 1374 (Fed. Cir. 2005) ("An applicant's argument made during prosecution may lead to a disavowal of claim scope even if the Examiner did not rely on the argument.").

Second, Plaintiffs argue that certain statements made by the Patent Owner (in its PTAB appeal brief) as to what "flue gas" "refers to" and "means" to a person of ordinary skill should be disregarded by this Court because in a different paragraph of that brief, the Patent Owner asserted that "flue gas" is not defined "to mean a temperature range." D.I. # 107, Pl. Op. Br. 46–52. But Plaintiffs neglect to point out that the express definition of "flue gas" that the Patent Owner provided—and which Defendants cite here—does not

define “flue gas” according to a temperature range, but rather as a “region of combustion gases.” D.I. # 108, Def. PFF ¶ 235. Here, too, Defendants are not proposing to define “flue gas” according to a temperature range.

2. In an Effort to Avoid the Patent Owner’s Statements Regarding the Meaning of “Flue Gas,” Plaintiffs Mischaracterize the Context in Which Those Statements Were Made.

Plaintiffs also argue that there is no contradiction between the claim construction that they seek here and the construction that the Patent Owner successfully sought during reexamination. Plaintiffs assert that the statements made during reexamination do not mean what they say because Defendants have taken “two sentences” out of context from the Patent Owner’s brief in the reexamination appeal. D.I. # 107, Pl. Op. Br. 45. Those sentences, however, are clear statements of the Patent Owner’s position on appeal, and the context in which they were made fully supports Defendants’ arguments with respect to those statements. The Patent Owner made the two statements *in offering a claim construction* for the terms “flue gas” and “thermolabile”—D.I. # 113, Def. PFF ¶¶ 234–244—two of the same terms that Plaintiffs have put at issue in these cases.

The Patent Owner’s legal introduction to the appellate brief on reexamination sets the framework:

The terms “flue gas” and “thermolabile” are entitled to the full breadth of their respective definitions as understood by persons of ordinary skill in the art. *See e.g.* MPEP 2111[.] A person of ordinary skill in the art is deemed to understand a claim term in the context of the claim language, the specification and the file history. *Phillips v. AWH Corp. et al.*, 415 F.3d 1303, 1313–14 (Fed. Cir. 2005) (internal citations omitted).

D.I. # 113, Def. PFF ¶ 236. After articulating the relevant law, the Patent Owner then discussed what the term “flue gas” means to a POSA in the context of the ’692 Patent and

the relevant prior art. D.I. # 113, Def. PFF ¶¶ 234–241. That same question is now currently before this Court, albeit with an even narrower standard than the “broadest reasonable interpretation” standard applicable to the reexamination. Def. Supp. PFF ¶ 944 (citing D.I. # 38-9, at 409 (in reexamination, “[c]laims must be given ‘their broadest reasonable interpretation in light of the specification’”)). The two sentences that Plaintiffs seek to disavow are the direct statements of the Patent Owner regarding how those two terms should be construed. Plaintiffs’ proposed constructions in the current litigation are explicitly **broader** even than the “broadest reasonable interpretation” constructions advocated by the Patent Owner during the reexamination.

Plaintiffs’ expert witness, Andrew Fry, attempted to dodge the Patent Owner’s statements in a way that raises questions about the credibility of his analysis. In the claim construction analysis in Dr. Fry’s First Report, he opined at length as to how external patent references provide circumstantial evidence for the meaning of claim terms, but with regard to the Patent Owner’s own direct statements of what the terms mean in the context of the patent, Dr. Fry said only this:

My opinion does not change after review of one particular statement made during the reexamination process that has been part of the claim scope contentions between the parties; namely the statement made during the reexamination in Respondent’s Brief (Oehr Depo. Exhibit 21, p. 6).

Def. Supp. PFF ¶ 944A. Dr. Fry does not say why his opinion “does not change” in light of the Patent Owner’s express statement on point. Inexplicably, Dr. Fry skips over this intrinsic evidence in favor of his own independent (and inconsistent) analysis of the same prior art references that the Patent Owner discusses in the appeal.

Plaintiffs, for their part, rely heavily on the PTAB’s statement that “[t]he claims . . . are silent as to either temperature or location of **treatment** of the flue gas.”

D.I. # 107, Pl. Op. Br. 54–55 (emphasis added (citing D.I. # 108, Pl. PFF ¶ 202)). As an initial matter, this statement concerns “treatment” of flue gas. Indeed, the passages relied on by Plaintiffs use the claim term “treatment” or “treating”—and not “injecting”—no fewer than three times. *See* D.I. # 107, Pl. Op. Br. 54–55. Under Plaintiffs’ own view of the claims, the location of the treatment is not necessarily the same as the location of injection. There is no dispute that if a method constitutes “injecting . . . into the flue gas,” the locational element of the claim has been satisfied. But that is beside the point, because the issue presented by Plaintiffs here is not where within the flue gas the **treatment** must occur, but rather the threshold question of what (and therefore where) “flue gas” is.

The PTAB’s statement about where **treatment** of the flue gas can occur in no way suggests that the term “flue gas” itself cannot have temperature or location limits. Indeed, immediately *after* discussing “treatment,” the PTAB presented its separate claim construction analysis for the term “flue gas,” which had been briefed by both parties. D.I. # 113, Def. PFF ¶¶ 255–265. In so doing, the PTAB discussed the location of flue gas and the corresponding typical temperatures of “flue gas.” D.I. # 113, Def. PFF ¶¶ 257–265. Plaintiffs’ suggestion that “flue gas” has no typical upper temperatures is nonsensical on its face, in light of the PTAB’s further analysis, the ’692 Patent specification (discussing at 4:66–5:11, for example, reactions at “temperatures typical of coal combustion flue gas”), and the Patent Owner’s own analysis of flue gas during the reexamination. D.I. # 113, Def. PFF ¶¶ 202–208, 255–265, 325.

Plaintiffs’ focus on temperature turns the question of “flue gas” on its head. The first question for the PTAB (and for the Court in the current litigation) is what “flue gas”

means in the context of the '692 Patent. Once that question was answered in the reexamination, the PTAB turned to consider what temperatures were typical of that flue gas, an issue raised by the requester's challenges to the patent, based on lack of written description and enablement. D.I. # 113, Def. PFF ¶¶ 262–264. In the context of *those* challenges, the Patent Owner answered the threshold question (what is the construction of “flue gas” in the context of the patent) as follows: “that region of combustion gases from the upper furnace region through the emission control devices.” D.I. # 113, Def. PFF ¶¶ 234–235. When the PTAB took up the next question, it said that the temperatures at the exit were “typical” of flue gas. D.I. # 113, Def. PFF ¶¶ 262–264.

Although it is not a limitation on “flue gas” per se, the phrase “temperatures typical of coal combustor flue gas” is part of the specification, and it essential to understanding the alleged invention. D.I. # 113, Def. PFF ¶ 194. The entirety of Oehr's work with regard to thermolabile molecular bromine precursors is limited to his recitation of temperature-dependent thermodynamic attributes of thermolabile molecular bromine precursors at flue gas temperatures. D.I. # 69, Oehr Dep. 199:3–17. Plaintiffs point to nothing in the specification that indicates that the “flue gas” at issue in the '692 Patent can be found in the combustion zone, either by direct statement or by implication in Oehr's discussion of what temperatures are typical of coal combustion flue gas.

3. Plaintiffs Misconstrue the Definition of “Flue Gas” Provided in the PTAB's Decision From the Reexamination Appeal.

Plaintiffs likewise mischaracterize the PTAB's analysis of the meaning of “flue gas.” Plaintiffs cite again to the PTAB's statement that the *claims* “are silent as to either temperature or location of treatment of the flue gas.” D.I. # 107, Pl. Op. Br. 34. As discussed previously, this statement references “treatment,” not “injection.” *Supra*,

§ 1.C.2. But regardless, it is clear that the PTAB’s preliminary statement (that there are no explicit temperature or location limitations explicitly written in the claims for the treatment of flue gas) serves only as the logical introduction to the PTAB’s analysis: if there are no express limitations in the claims regarding the temperature and location of flue gas, then *it is necessary to consider the definition of flue gas to understand its typical temperature and location range*. This understanding of the PTAB’s “silent as to” statement must be correct because the PTAB immediately thereafter analyzed the typical temperature and locations of flue gas. D.I. # 113, Def. PFF ¶¶ 255–277 (D.I. # 38-10, Decision on Appeal, at 6–7). Such analysis would be nonsensical under Plaintiffs’ reading of the statement, which is evidently that “flue gas” is unlimited as to either temperature or location. D.I. # 107, Pl. Op. Br. 55 (asserting that the PTAB used “clear language” to state “that ‘flue gas’ is not limited by ‘temperature or location’”).

The PTAB, however, analyzed the typical temperatures of gases at various locations in a coal combustion system, and then tied those temperatures to its broadest reasonable interpretation of “flue gas.” D.I. # 113, Def. PFF ¶¶ 255–277 (D.I. # 38-10, Decision on Appeal, at 6–7) In particular the PTAB appeared to rely on the temperatures at various locations of the system from Madden, listing the following:

- the coal input to the boiler (3000°F [1649°C]);
- the upper portion of the furnace (2300°F [1260°C]);
- the very low temperatures such as at the outlet of a wet scrubber (150°F [66°C]).

D.I. # 113, Def. PFF ¶ 258.

This analysis is directly on point to the debate between the parties in this litigation, as Plaintiffs assert that flue gas includes the coal input to the boiler, *see* D.I. #

108, Pl. PFF ¶ 193; D.I. # 107, Pl. Op. Br. 13–14, while Defendants (and the Patent Owner during the '692 Patent reexamination appeal) assert that it begins in the upper portion of the furnace, D.I. # 113, Def. PFF ¶¶ 235–240. The PTAB then stated which temperatures are applicable to flue gas:

Thus, the broadest interpretation of the term 'flue gas' includes gases at temperatures up to 1260°C or higher. We find this broader interpretation of "flue gas" to be reasonable because the prior art related to treating flue gas from coal combustion supports the finding that flue gas treatment materials may be injected in several locations between the boiler and the stack outlet.

D.I. # 113, Def. PFF ¶¶ 255–259.

The temperature, 1260°C, is taken from Madden's discussion of the temperature in the upper portion of the furnace. D.I. # 113, Def. PFF ¶ 260. The PTAB notably did not choose the temperature that Madden identified as the temperature of the coal input to the boiler. D.I. # 113, Def. PFF ¶ 262. Plaintiffs cling to the phrase "or higher" to argue that the PTAB held that there are no temperature or location limitations that apply to "flue gas." D.I. # 107, Pl. Op. Br. 55. If that is what the PTAB meant, it certainly had more direct ways to say as much. It would also render its analysis of locations meaningless. Indeed, if the PTAB disagreed with the Patent Owner and concluded that "flue gas" includes the coal input to the boiler, one would have expected the PTAB to simply hold that the broadest reasonable interpretation included temperatures up to 1649°C.

A much simpler explanation for the phrase "or higher" is that the PTAB was careful not to put an exact temperature limit on the temperatures typical of flue gas. D.I. # 113, Def. PFF ¶ 262. In fact, on the previous page, the PTAB considered a different reference, Granite, which described a system that had flue gas exiting the furnace at

1371°C. D.I. # 113, Def. PFF ¶ 263. The PTAB’s statement on flue gas is consistent with the meaning offered by Patent Owner, who defined it as starting in the upper furnace, not in the coal input to the boiler or the combustion zone. D.I. # 113, Def. PFF ¶¶ 234–235. And regardless, if the PTAB’s decision is ambiguous, the Patent Owner’s statements regarding what flue gas “means” and “refers to” are clear, as discussed.

Plaintiffs argue that their proposed construction is consistent with the PTAB’s statement, quoted above, that “the prior art related to treating flue gas from coal combustion supports the finding that flue gas treatment materials may be injected in several locations between the boiler and the stack outlet.” D.I. # 107, Pl. Op. Br. 55. It is not. First, the phrase “between the boiler and the stack outlet” does not include the boiler. Even if the Court were to conclude that “between” includes the boiler, Defendants’ construction of “flue gas” includes one portion of the boiler, “the upper furnace.” D.I. # 108, Pl. PFF ¶ 212. Second, the statement again references locations for injection of treatment materials for the *treatment* of flue gas, and as discussed above, there are multiple methods of introducing such materials, and not all of those methods require that those materials be introduced by “injecting into the flue gas” as the ’692 Patent does. *Supra*, § I.B.4.

Plaintiffs also argue that it is significant that Dr. Wilcox explained that some combustion zones operate at temperatures around 1371°C. D.I. # 107, Pl. Op. Br. 55. This is of no significance to the dispute here, or the interpretation of the statements made by the PTAB or Patent Owner. Neither the PTAB, nor the Patent Owner, nor Defendants, define “flue gas” by an exact temperature range. As explained, the PTAB

selected a temperature that corresponds to the upper furnace instead of one that corresponds to the coal input to the boiler. D.I. # 113, Def. PFF ¶ 257.

D. Plaintiffs Distort and Misrepresent Other People’s Patents.

In their brief in support of their motion for summary judgment, Plaintiffs largely miss the mark with respect to Defendants’ arguments as to how Oehr used relevant terms in his other patents and patent applications—one of which is cited in the ’692 Patent. *See* D.I. # 112, Def. Op. Br. 54, 56-57.⁷ This is telling, because as Defendants explain in their opening brief, Oehr has consistently recognized the distinctions between the three known methods of introducing chemicals into a power plant. *See* D.I. # 112, Def. Op. Br. 56-57.

Instead, Plaintiffs devote significant portions of their brief to how *other* people’s patents purportedly use the terms “flue gas” and “injecting into the flue gas.” These

⁷ Defendants’ opening brief explains that Oehr’s other patents also distinguished among different methods for introducing chemicals into coal-fired power plants, and indeed that his ’548 patent (U.S. Patent No. 8,142,548)—which has claims directed to “injecting into the flue gas”—cannot encompass injecting into the combustion zone. D.I. # 112, Def. Op. Br. 56-57. In response, Plaintiffs argue that the Oehr ’548 Patent claims’ use of the term “injecting into the flue gas” does not include injection into the combustion zone because the claims also require that such injection be “ahead of a particulate collection device.” D.I. # 107, Pl. Op. Br. 77-78. Plaintiffs’ argument fails for three reasons. First, Plaintiffs argue that the combustion zone contains flue gas, and do not dispute that the combustion zone is “ahead of” the particulate filter in all plants that contain one. Second, there is no plain reading of the claim language “ahead of a particulate collection device” that means the injection must occur “downstream” and “near” the collection device, as Plaintiffs advocate, rather than simply “ahead of” it, as the claim states. Third, Plaintiffs’ need some evidence that a POSA would understand “ahead of” to mean “immediately before”—and yet, their only citations for their entire argument, at pages 77-78 of their brief, are (i) D.I. # 108, Pl. PFF ¶ 441, in which Plaintiffs’ attorney characterizes the patent and claim without any expert testimony; and (ii) D.I. # 108, Pl. PFF ¶ 442, which recites claim 1 of that patent. The injection must occur “ahead of” the particulate collection device so that any mercury that adsorbs onto an injected particle is removed by the collection device; injection “behind” the collection device—the only other alternative—would render the collection device irrelevant.

discussions ignore a principal and central tenet of claim construction—the question before the Court is what those terms mean in the '692 Patent, not how *other* inventors may have chosen to define or use the terms in their patents. That some of the other patents are referenced in the '692 Patent does not make their contents the words of the inventor. *See SkinMedica, Inc. v. Histogen Inc.*, 727 F.3d 1187, 1207 (Fed. Cir. 2013) (in specification, general citation to and “incorporation by reference” of document does not sufficiently “indicate . . . reliance on that particular passage to define” a claim term). Even apart from their lack of relevance, these documents do not support Plaintiffs’ position.

1. Madden '187 Patent

Nowhere is Plaintiffs’ distortion of the prior art patent record more egregious than in their treatment of several patents issued to Deborah Madden. Plaintiffs assert that U.S. Patent No. 6,372,187 (the Madden '187 Patent) characterizes both pre-treating coal, and injecting chemicals into the combustion zone of a boiler, as “injecting into the flue gas.” D.I. # 107, Pl. Op. Br. 42 (“Madden also explains that the additives that her invention requires be ‘injected into the flue gas stream’ can be so injected by adding them to the coal and then injecting them into the combustion zone with the coal, or injecting them into flue gas that is further downstream”); *id.* 49 (“Madden explicitly states that one can ‘inject [an additive] into the flue gas stream’ by mixing it with the coal and injecting it into the combustion zone.”). Indeed, to further their arguments, Plaintiffs “helpfully” insert the bracketed words “into the flue gas” or “into the flue gas stream” into quotations from the Madden '187 Patent, even though those words do not appear in those source quotations. *See, e.g.*, D.I. # 107, Pl. Op. Br. 49 (“Madden makes clear that: ‘[t]he temperatures for injection of the sorbent [into the flue gas stream] range from those

typical at the coal input to the boiler (3000°F.) and in the upper portion 28 of a furnace (2300°F.) to very low temperatures such as at the outlet of a wet scrubber (150°F.)”). Plaintiffs “helpful” suggestions, however, are belied by the undoctored text of the source. Moreover, the Madden ’187 Patent carefully reserves the term “injecting into the flue gas” for the method to which that term refers—and never uses that term to describe pre-treating coal or injecting chemicals into the combustion zone.

Neither Plaintiffs’ brief, nor their PFFs characterizing Madden, focus on the precise language that Madden uses in the ’187 Patent to distinguish among different ways of delivering chemicals into the power plant system. Accordingly, Plaintiffs run roughshod over the careful distinctions that Madden makes and ignore that Madden uses several different terms to describe the introduction of chemicals into the power plant, depending on the method used for the introduction—*i.e.*, Madden uses the terms “alkaline sorbent injection” to describe the process of introducing the alkaline sorbent somewhere in the system, D.I. # 108, Pl. PFF ¶ 217 (D.I. # 38-12, Madden at 3:55–59), and the term “inject[ing] into a power plant system” (*id.* (Madden at Abstract, 2:38–42; 4:56; 5:24–25)) to describe the general introduction of chemicals into the system.⁸ Likewise, Plaintiffs ignore that Madden speaks about chemicals being “delivered into the

⁸ Plaintiffs in these cases similarly use the term “injecting” very broadly, and not just when referring to the introduction of a substance into the chamber of a furnace or boiler or the ductwork. Thus, Plaintiffs also use the word “injection” to describe dripping a liquid substance onto cold coal, as a way of pre-treating the coal. D.I. # 77, Fry Dep. 230:6–12; *cf.* D.I. # 113, Def. PFF ¶ 747 (district court holding that “the [’]692 Patent differs from the Chem-Mod Solution in both when it is applied (after the coal is burned vs. before the coal is burned) and how it is applied (injected into the flue gas vs. mixed with cold coal)”).

flue gases” (*id.* (Madden at 3:41–42)) when referring to chemicals finding their way into the flue gases.

Had Plaintiffs recognized the different terms that Madden uses in the ’187 Patent, they would acknowledge that Madden never refers to pre-treatment or injecting into the combustion zone as “injecting into a flue gas stream.” *See, e.g., id.* at (Madden at 3:42–45 (“the alkaline sorbent may be ***delivered into the flue gases*** . . . with the fuel”) (emphasis added), 4:8–12 (“ . . . sorbent injection for mercury capture . . . (examples include introduction with the coal feed)”).

And likewise, Plaintiffs would recognize that when Madden does use the term “injecting into flue gas” in the ’187 Patent, she does not use it to refer to pre-treatment, or injecting into the combustion zone. For example, Madden teaches that “sorbent injection” for purposes of controlling mercury “***includes*** the injection . . . into a flue gas” (*id.* (Madden at 3:55–57 (emphasis added))), but when referring to introduction into the combustion zone or at the coal inputs, Madden uses the generic term “injection of the sorbent” (*id.* (Madden at 3:65))—***not*** “injection into flue gas.” And finally, the claims require a “sorbent injection means for providing an alkaline sorbent . . . to the boiler flue having a temperature below 2000 °F.” *Id.* (Madden at 5:63–65; 6:40–42; 8:5–7). In her ’187 Patent, Madden recognizes the three different methods for introducing and delivering chemicals, *see* D.I. # 113, Def. PFF ¶¶ 157, 213–217, 307, 310–311, and preserves the distinction among them in the text of the Patent—distinctions that Plaintiffs simply ignore.

Plaintiffs also assert that Madden teaches that the term “flue gas” includes all of the gases in the furnace that are produced from the combustion of coal, and that such

teaching should be applied to the '692 Patent. D.I. # 107, Pl. Op. Br. 51–52, 55–56.

This, too, fails at several levels.

First, even if the Madden '187 Patent had specifically defined “flue gas” to include all such combustion gases, such a definition or teaching in the Madden patent would not provide evidence for Plaintiffs’ proposed construction of “flue gas” as used in the '692 Patent. They are different patents, with entirely different specifications. A patentee is his or her own lexicographer, and it is the teachings of the intrinsic evidence of the patent-at-issue that governs the claim construction. *Phillips*, 415 F.3d at 1316. Indeed, the lack of anything in the '692 Patent approaching the Madden '187 Patent’s purportedly broad and detailed discussion of “flue gas” shows that a POSA would understand “flue gas” differently in the '692 Patent.

Second, there is no clear statement in the Madden '187 Patent that “flue gas” is as broad a term as Plaintiffs contend. For example, the Madden '187 Patent refers repeatedly to flue gases in specific locations—such as “the flue gases in the upper furnace cavity” (D.I. # 108, Pl. PFF ¶ 217 (D.I. # 38-12, Madden at 1:51)) and flue gases “having a temperature below 2000°F” (*id.* (Madden at 6:42)), but none of this compels Plaintiffs’ conclusion that the gases in the even hotter combustion zone are “flue gases.” Instead Plaintiffs rely on an arrow in Figure 2 that bears the label “42,” which is the number used to refer to different locations of flue gas. D.I. # 107, Pl. Op. Br. 42–43. But not only is that arrow far from the combustion zone; it is also pointing to the region “28,” which refers to the Upper Furnace. *Id.* 43. So the arrow and figures certainly provide no evidence at all that Madden—let alone Oehr, in a different patent that does not have any figures—considered there to be flue gas in either the combustion zone or the lower

furnace more generally. D.I. # 108, Pl. PFF ¶ 219–225 (“Madden states that ‘hot flue gases 42, containing contaminants such as mercury, are generated in the boiler 24 furnace, and rise through upper furnace region 28.’”). Indeed, the Patent Owner cited the Madden ’187 Patent in support of his proposed construction, which supports Defendants’ construction, not Plaintiffs’: “To persons of ordinary skill in the art, ‘flue gas’ means that region of combustion gases from the upper furnace region through the emission control devices.” D.I. # 108, Pl. PFF ¶ 253 (citing D.I. # 38-12, Madden at 4:1–13).

Third, Plaintiffs refer repeatedly to statements in the Madden ’187 Patent that the flue gas is “from the combustion of coal” or “rise through upper furnace” as evidence that flue gas must necessarily occupy the lower furnace. D.I. # 107, Pl. Op. Br. 56 (citing D.I. # 108, Pl. PFF ¶¶ 202, 261, 265–266) (“[I]n deciding that flue gas exists at temperatures of ‘1260 °C or higher’ and included those in the upper furnace region, [the PTAB] plainly intended to include the entire boiler, and explicitly said so when it stated: ‘the prior art relating to treating flue gas from coal combustion supports the finding that flue gas treatment materials may be injected in several locations between the boiler and the stack outlet.’”); D.I. # 107, Pl. Op. Br. 43 (citing D.I. # 108, Pl. PFF ¶¶ 216–230) (“Madden then explains that ‘hot flue gases . . . rise through upper furnace region 28.’” . . . Madden then teaches that the sorbent 14 ‘may be delivered into the flue gases 42, 44, 46 [numbered at different places in the system] at one or more locations of the upper furnace region 28 . . . or in with the fuel 38.’ Thus Madden teaches that flue gas exists in the combustion zone.”). But such statements do not state that the gases in the lower furnace or combustion zone are “flue gas,” and do not imply it, either. At most, they stand for the unsurprising proposition that coal combustion flue gas is formed from the

combustion of coal. And as explained above, stating how flue gas is formed does not address the question of what “flue gas,” or more appropriately, what “injecting into flue gas,” means in the ’692 Patent.

Finally, as explained in Defendants’ opening brief in support of their motion for summary judgment, POSAs recognized three methods for introducing chemicals into a coal-fired power plant, one of which was the “injecting into flue gas” method of the ’692 Patent claims. D.I. # 113, Def. PFF ¶¶ 164, 307. The precision that Madden uses in her ’187 patent to distinguish among these three methods, as well as the detail that she provides to describe the use of methods other than “injecting into flue gas” to accomplish the goal of “deliver[ing]” chemicals into the flue gas or the power plant systems, provides strong evidence that Oehr’s lone focus on “injecting into the flue gas” was meant to refer only to that method.

2. Madden ’288 Patent

Plaintiffs also cite statements in another Madden patent, U.S. Patent No. 5,814,288 (the Madden ’288 Patent), making largely the same arguments as with her ’187 Patent, but also asserting repeatedly that the Madden ’288 Patent “refers to the presence of flue gas in the furnace.” D.I. # 107, Pl. Op. Br. 61; D.I. # 108, Pl. PFF ¶¶ 315 (referencing statement in “Summary of the Invention” that patent is directed to “a method for desulfurizing and removing particles from flue gas produced during a combustion process in a furnace of a steam generator to produce treated flue gas.”), 316 (“The claims of the ’288 Patent also refer to the presence of flue gas in the furnace.”).

Plaintiffs’ arguments are immaterial to the question of claim construction for the same reason that the arguments derived from purported statements in the ’187 Patent are of no moment. At best, the statements reflect Madden’s own definitions and use of the

term “flue gas” in her patents, and the differential teachings between Madden and Oehr suggest—if anything—that Oehr was using “flue gas” differently.

Indeed, the Madden ’288 Patent is not intrinsic evidence⁹ or otherwise relevant to claim construction, and in any event, these sentences regarding the ’288 Patent add nothing in support of Plaintiffs’ claim construction position. First, they do not “refer to the presence of flue gas in the furnace” or state that there is flue gas “in the furnace”—they simply state that combustion takes place in the “furnace.” D.I. # 108, Pl. PFF ¶¶ 311, 315. The inference that these statements in the ’288 Patent “refer to the presence of flue gas in the furnace” is also in tension with what Figs. 1, 2, and 3 of the ’288 Patent depict: each bears the legend “Note: Flue gas streams are shown in bold”; each figure has multiple bolded arrows; and none of the bolded arrows is within the boiler. D.I. # 108, Pl. PFF ¶¶ 309–310; Def. Supp. PFF ¶¶ 939–940.

Second, any statement that flue gas is formed from combustion does little to advance the central claim construction issues, as explained above.

And third, even placing flue gas in the “furnace” would provide no information relevant to claim construction. As conceded by Plaintiffs’ expert witness, Andrew Fry, the terms “boiler,” “furnace,” and “combustor” are used in a variety of different ways. D.I. # 113, Def. PFF ¶ 115. And the furnace itself includes the “combustion zone” as

⁹ Nor is the Madden ’187 Patent. Plaintiffs argue that these patents are part of the intrinsic record because they were cited during the reexamination. D.I. # 107, Pl. Op. Br. 42–44. But neither was even mentioned on the face of the patent—let alone incorporated by reference into the Specification, as required. *See SkinMedica, Inc. v. Histogen Inc.*, 727 F.3d 1187, 1207 (Fed. Cir. 2013) (in specification, general citation to and “incorporation by reference” of document does not sufficiently “indicate . . . reliance on that particular passage to define” a claim term).

well as other regions of the plant. *See, e.g.*, D.I. # 108, Pl. PFF ¶¶ 58, 59, 85, 93, 222–223, 226–227, 265, 324, 417.

3. Knowles

Plaintiffs argue that the Patent Owner’s positions during the reexamination are not what they say because the reexamination appeal brief submitted by the Patent Owner (erroneously referred to as “Oehr” in Plaintiffs’ brief) cited Madden as well as the Knowles 5,787,823 Patent. D.I. # 107, Pl. Op. Br. 49–50. Plaintiffs argue that Knowles also “is crystal clear that ‘flue gas’ is formed in, and exists in, the combustion zone.” *Id.* 49. Plaintiffs reproduce Figure 1 from Knowles in their brief:

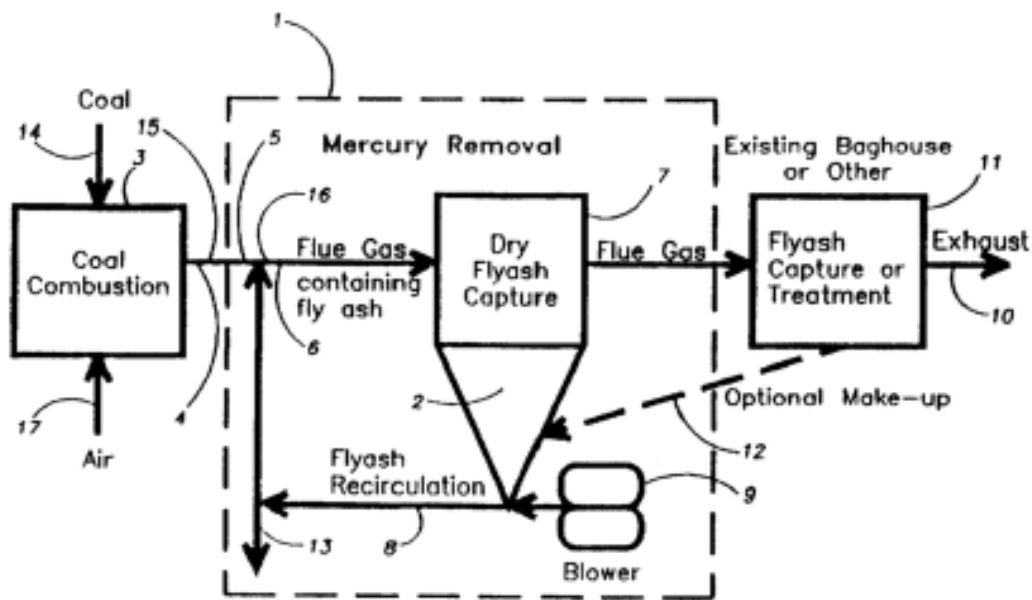


Figure 1

Id. Yet, as acknowledged in Pl. PFF ¶ 256, and at Knowles at 9:40–41, the “combustion chamber” is labelled as element “3” in the diagram, where “coal . . . is burned.”

According also to Plaintiffs’ PFF, and to Knowles, “[t]he byproducts of combustion in chamber 3 is ‘a combustion gas stream 4’ which travel through conduit 15.” D.I. # 108,

Pl. PFF ¶ 257 (citing D.I. # 38-10, Knowles at 9:41–43). Accordingly, Knowles actually refers to the “products of combustion” as “a combustion gas stream.” The diagram does not assign the label “Flue Gas” until Conduit 16, as can be seen from Figure 1. D.I. # 107, Pl. Op. Br. 50. Once again, Plaintiffs provide their interpretation of the figure, without any evidentiary support, stating—in contradiction to the diagram:

It can be seen from Knowles Figure 1 that it depicts coal going into the combustion zone and “flue gas” coming out of that coal combustion area. Thus it is clear that Knowles also shows ‘flue gas’ being created in the combustion zone.

Id. 50. The only evidence Plaintiffs cite from Knowles does not show that flue gas “exists in” the combustion zone. To the contrary, Knowles identifies flue gas *after* the “combustion gas stream 4.” D.I. # 108, Pl. PFF ¶ 257 (citing D.I. # 38-10, Knowles at 9:41–43). Thus, Knowles does not support Plaintiffs’ proposed construction, but instead supports that of Defendants—by declining to place “flue gas” within the combustion zone. And Hazelmere’s citation to Knowles Figure 1 during the PTAB appeal for its argument that “‘flue gas’ means that region of combustion gases from the upper furnace region through the emission control devices” makes perfect sense, as Figure 1 of Knowles labels the gases *after* the combustion zone as “flue gas.” D.I. # 107, Pl. Op. Br. 48–49; D.I. # 108, Pl. PFF ¶ 253.

Plaintiffs assert that Defendants’ expert, Dr. Jennifer Wilcox, “contends that ‘combustion gas’ only refers to gas in the combustion zone,” D.I. # 107, Pl. Op. Br. 50–51, but offer no citation for this assertion. On the contrary, Dr. Wilcox opined that “flue” modifies “coal combustion gas” to result a narrower term “coal combustion flue gas.” Def. Supp. PFF ¶ 935. Plaintiffs also cite Knowles for the proposition that the broader phrase “combustion gas” is sometimes applied to gases downstream of the combustion

zone, without the modifier “flue.” D.I. # 107, Pl. Op. Br. 51. But that proposition is not inconsistent with any of Defendants’ positions, for it is Defendants’ consistent position that “coal combustion flue gas” is a subset of “coal combustion gas”—*i.e.*, “coal combustion flue gas” is the “coal combustion gas” that *is in the “flue.”* Nor does Plaintiffs’ proposition shed any light on the parties’ dispute over the meaning of “flue gas.”

4. Felsvang

Plaintiffs’ brief also discusses U.S. Patent No. 5,435,980 (the Felsvang ’980 Patent), which is cited in the ’692 Patent. *Id.* 75–76; D.I. # 113, Def. PFF ¶ 216. Plaintiffs do not suggest that Felsvang supports Plaintiffs’ construction of “flue gas,” but rather only discuss Felsvang in purported anticipation of Defendants’ arguments. D.I. # 107, Pl. Op. Br. 75–76. It is true, as Plaintiffs write, that “Felsvang discusses introducing additives to increase the chloride content of flue gas, and says that can be done by adding the additive to the coal before or during combustion, ‘or injecting into the flue gas upstream of or in the drying-absorption zone.’” *Id.* 75–76 (citing D.I. # 108, Pl. PFF ¶ 433). Plaintiffs attempt to argue that these teachings of Felsvang do not support the idea that “injecting into flue gas” has a special meaning, D.I. # 107, Pl. Op. Br. 76, but Plaintiffs do not offer any evidence from Felsvang where “injecting into flue gas” is used to refer to pre-combustion addition of a chemical. On the contrary, all that Plaintiffs argue is that Felsvang uses other terms such as “introducing” or “adding” when discussing post-combustion injection into the flue gas. *Id.* That Felsvang uses a broad term such as “introducing” to refer to both pre-combustion addition and “injection into the flue gas” in no way requires reading the narrower term “injection into flue gas” to encompass pre-combustion addition to coal.

5. Ide

Plaintiffs' description of U.S. Patent No. 4,729,882 (the Ide '882 Patent) is misleading. *See id.* 75. The Ide '882 Patent describes three ways of increasing the chlorine content of a combustion gas stream: injecting a treatment gas such as HCl into the emissions gases; adding a substance to the material to be incinerated; and burning material that already contains the desired additive. D.I. # 113, Def. PFF ¶ 213. The '692 Patent refers to Ide's disclosure of "massive hydrogen chloride injection into mercury containing flue gas." D.I. # 108, Pl. PFF ¶ 430 (citing D.I. # 38-1, '692 Patent at 1:28–47). Plaintiffs attempt to argue that the '692 Patent's reference to the "injection" into flue gas of massive amounts of "hydrogen chloride" encompasses all three methods disclosed in Ide, D.I. # 107, Pl. Op. Br. 75, but that is incorrect. Setting aside the use of the term "injection"—which term does not appear in the Ide patent—the '692 Patent's reference to "hydrogen chloride" is clearly a reference to the first method alone, as the Ide patent consistently and exclusively refers to hydrogen chloride gas being added directly to the emission gas, rather than being added with the fuel. D.I. # 108, Pl. PFF ¶¶ 427, 429 (citing D.I. # 109-11, Ide at 4:4-16 (describing the chlorine-containing material that would be added with the waste for combustion as "e.g. plastics, salt or the like that contains chlorine or have chlorine action."))).

6. Zamansky

Plaintiffs also rely on a pair of related references by Zamansky. D.I. # 107, Pl. Op. Br. 12. In particular, Plaintiffs rely on arrows that are labeled as "flue gas," arguing that they extend out of the area pointed to as the combustion zone. *Id.* While it would be odd indeed to define "flue gas" based on schematic drawings in unrelated references (the '692 Patent does not cite either Zamansky reference) rather than according to an intrinsic

record in which the Patent Owner states what “flue gas” means, Plaintiffs have also misrepresented the Zamansky reference. Plaintiffs cite to 11:30–34 of U.S. Patent No. 6,206,685 for teaching that “‘combustion flue gas’ forms immediately upon the introduction of the coal with the metal additive into the combustion zone of the boiler.” D.I. # 108, Pl. PFF ¶ 305. Nothing in that section discusses a combustion zone or flue gas. Elsewhere, that patent does say combustion flue gas forms from combustion, Def. Supp. PFF ¶ 938, but as discussed throughout this response, the principle that flue gas is the *result* of combustion is undisputed and does not answer the question of whether any of the gases in the combustion zone are “flue gas” as contemplated by the ’692 Patent.

7. ’894 European Application

Plaintiffs rely on another unrelated patent application, European EP 1005894, which once again does not offer any evidence that would support Plaintiffs’ proposed construction over that advocated by Defendants. Plaintiffs copy and highlight Figure 1, which shows flue gas in several places throughout a fuel-fired power plant. D.I. # 107, Pl. Op. Br. 61. The first location labeled is a pair of arrows *above* the combustion zone, and there are subsequent arrows throughout the system. *Id.* The figure thus supports Defendants’ proposed construction, and does not show “flue gas” in the combustion zone, as required by Plaintiffs’ infringement theories.

E. Plaintiffs’ Proposed Claim Construction Relies Extensively on Evidence That Coal Combustion Flue Gas Is Formed From the Combustion of Coal, but Such Evidence Does Not Resolve or Even Inform the Question of What “Flue Gas” Means in the ’692 Patent Claims, and in Particular What “Injecting Into the Flue Gas” Means in Those Claims.

Plaintiffs cite and rely on numerous extrinsic sources for the proposition that flue gas arises from the combustion of coal. *See, e.g.*, D.I. # 107, Pl. Op. Br. 57–59 (citing

D.I. # 108, Pl. PFF ¶ 302 and *Steam*, for, *inter alia*, parenthetical reference to “flue gas” as “products of combustion”), 62–63 (citing D.I. # 108, Pl. PFF ¶¶ 318–319 and general science dictionaries for same proposition).¹⁰ But the ’692 Patent claims are directed to a method for treating “coal combustion flue gas” or “flue gas . . . produced by the combustion of coal”; it is unhelpful, for the purpose of claim construction, to simply restate the claim term that purportedly requires construction (*i.e.*, “flue gas”) in terms of other words that are similarly undefined. *See Meds. Co. v. Mylan, Inc.*, 853 F.3d 1296, 1301 (Fed. Cir. 2017).

Plaintiffs’ proposed construction does not resolve the question of what is the “flue gas” into which the thermolabile molecular bromine precursor must be injected, because, as explained above, it does not address how much combustion needs to take place before the “products” are “flue gas”; whether the products, when mixed with other gases, are “flue gas” for purposes of injection; or the point at which the gas leaving the smokestack—which was derived from the combustion of coal—ceases to be “flue gas.” Nor does it address whether transformations in the combustion gases brought about by air pollution treatment, which may change the content and composition of the gas, means that such gas is no longer the “products of combustion.”

The record in this case contains multiple references supporting the principle that “flue gas” is used differently by different people in the field, in different contexts.¹¹

¹⁰ Notably, the only reference that is directed to the POSA of the patent and provides an actual definition of “flue gas” (rather than a parenthetical) is addressed in Plaintiffs’ PFF ¶ 320, and supports Defendants’ proposed construction.

¹¹ D.I. # 113, Def. PFF ¶ 283 (D.I. # 66, Lokenvitz Dep. 99:18–25 (“To me flue gas is in the ductwork after it’s left the boiler.”), 100:9–14 (“I’ve always heard that [flue gas is]

Notably, Plaintiffs’ expert witness, Andrew Fry, was vague and confused in this regard, as in his First Expert Report he stated that combusted coal “forms the flue gas, which is a gaseous byproduct with the major components being nitrogen, carbon dioxide, water and *residual oxygen*.” See D.I. # 108, Pl. PFF ¶¶ 52, 60 (citing D.I. # 78, First Fry Report ¶ 59) (emphasis added). Although Dr. Fry does not explain what he means by “residual oxygen,” from the context it is clear that it refers to unreacted oxygen from the combustion air. Even Plaintiffs’ expert witness, then, provided an explanation of “flue gas” that is *different* from Plaintiffs’ proposed definition—“the gas produced during the combustion of coal.” Compare D.I. # 107, Pl. Op. Br. 31–32, with D.I. # 113, Def. PFF ¶ 126. Or, at least, that statement cited above in Dr. Fry’s First Report makes clear that “produced” is no less vague a word than the claim term Plaintiffs say it should be used to define. Compare Plaintiffs’ Proposed Definition of Flue Gas (“the gas produced during the combustion of coal”) with Dr. Fry’s statement that “the flue gas, which is a gaseous byproduct with the major components being nitrogen, carbon dioxide, water and *residual oxygen*.” See D.I. # 108, Pl. PFF ¶¶ 52, 60 (citing D.I. # 78, First Fry Report ¶ 59) (emphasis added).

in the ductwork after it’s left the furnace.”), 112:21–113:11 (“It refers to the gas that has left the boiler. And once it’s in the ductwork, then I classify it as flue gas.”); D.I. # 96, Hujet Dep. 40:4–19 (“I don’t really talk about that as being flue gas at that point. It’s the combustion zone, I call it.”); D.I. # 65, Kaminski Dep. 193:5–194:11 (“[Flue gas is] after the combustion process as it’s exiting the furnace.”); D.I. # 63, Comrie Dep. at 270:24–272:10 (“Q. Is there any point in this process where you would refer to the gas flowing through the system as flue gas? MR. EVALL: Objection; lack of foundation, calls for speculation and vague. THE WITNESS: Probably at the exit of FF ESP. And they have that going into the wet flue gas desulfurization unit.”), 302:10–303:11 (“Q. Is it your position that flue gas and combustion gas are two different gases? A. That’s correct. Q. That’s not the same gas at different locations in the furnace? A. They’re two different gases.”).

F. To the Extent That Plaintiffs’ Arguments Rely on Improper “Technical Opinion” Evidence That Was Not Disclosed in Accordance With the Rules, Such Arguments Should Be Disregarded.

Plaintiffs’ openly brief cites repeatedly to technical opinion evidence, including opinions concerning technical matters relating to claim construction, that is sponsored by Plaintiffs’ attorneys (*e.g.*, D.I. # 107, Pl. Op. Br. 12, 13, 15, 16, 59–60, 79); Plaintiffs’ current employee John Meier (*e.g.*, D.I. # 107, Pl. Op. Br. at 63–64); Plaintiffs’ former employee Bruce Keiser (*e.g.*, *id.*); and the named inventor, Klaus Oehr (*e.g.*, *id.* 64). *See also* D.I. # 108, Pl. PFF ¶¶ 118–120, 123–125, 131, 260, 326–331. None of these technical opinions is admissible because Plaintiffs have not complied with the disclosure requirements of Fed. R. Civ. P. 26(a)(2)(A) with respect to *any* of the individuals. This disclosure requirement has no exception: “all witnesses who are to give expert testimony under the Federal Rules of Evidence must be disclosed under Rule 26(a)(2)(A).” *Musser v. Gentiva Health Services*, 356 F.3d 751, 756–57 (7th Cir. 2004). Moreover, the Court’s Preliminary Pretrial Conference Order confirmed that “[a]ny party who will be offering expert opinions during any phase of this case must provide a written report that complies with Rule 26(a)(2)(B).” D.I. # 35 ¶ 5.

Defendants have, concurrent with this briefing, moved to strike those PFFs filed by Plaintiffs that purport to proffer or rely on technical opinions that were not disclosed as required, as well as those arguments in Plaintiffs’ briefs that rely on those afflicted PFFs. In addition, because such “evidence” is not competently offered, those sections of Plaintiffs’ briefs that rely on those opinions should be disregarded in considering Plaintiffs’ arguments.

Those sections of Plaintiffs’ opening briefs should be disregarded for the additional reason that none of the sponsoring witnesses has established that he or she can offer competent opinions regarding the knowledge of a POSA. Likewise, Oehr’s opinions should be disregarded for the additional reason that an inventor’s effort to broaden the scope of a claim post-issuance is irrelevant to claim construction. *See, e.g.*, D.I. # 107, Pl. Op. Br. 51 n.20.

Finally, all references to, or reliance on, Plaintiffs’ PFF ¶¶ 98–104 should be disregarded, as should any reliance on either the so-called “Ashish Fande Article” or “Himachandra.” *See* D.I. # 107, Pl. Op. Br. 14–15, 58. These two documents purport to be published articles, but (i) no fact witness or expert witness has identified the articles; (ii) no fact witness or expert witness has identified, or was familiar with, the “journals” that purportedly published them; and (iii) no expert witness has cited either document as reliance or consideration material for forming opinions. *See, e.g.*, D.I. # 113, Def. PFF ¶¶ 98–10. The **only** testimony concerning the documents is from Plaintiffs’ attorney, Cassandra Klingman, who purports to identify and characterize and interpret portions of the documents. *See, e.g.*, D.I. # 107, Pl. Op. Br. 58 (characterizing document as “industry publication”); *id.* (characterizing document as “depict[ing] the flow of flue gas in a different manner”); *id.* (asserting that the document is “consistent with the point that those in the industry understand flue gas to be in the combustion zone”); D.I. # 108, Pl. PFF ¶¶ 100 (“Figure 7 depicts . . .”), 103 (“Figure 6 depicts”), 104 (“Fig. 5 . . . depicting”).

G. Plaintiffs Incorrectly Argue That “Injecting Into Said Flue Gas” Must Be Commensurate in Scope With the Meaning of “Flue Gas.”

Plaintiffs argue that “injecting into said flue gas” must be commensurate in scope with the meaning of “flue gas,” as if construing “flue gas” would fully construe the method step. *See* D.I. # 107, Pl. Op. Br. 28–29. “Injecting into flue gas,” however, refers to a specific method, which is why the term needs to be interpreted as a whole. Thus, there is nothing improper or inconsistent between Defendants’ proposed constructions for the substance “flue gas” on the one hand, and for the action of “injecting into flue gas” on the other. *See e.g., id.*

Defendants’ proposed construction for “flue gas” recognizes that the intrinsic record of the ’692 Patent provides a clear construction for that term, as the Patent Owner stated to the PTAB. D.I. # 113, Def. PFF ¶ 239. The construction for “injecting into the flue gas,” by contrast, recognizes that the term has a particular meaning in the industry. *See* D.I. # 113, Def. PFF ¶¶ 310, 386–388.

Defendants have confirmed that the industry usage consistently distinguished among three different methods for introducing chemicals into coal combustion systems, and “injecting into flue gas,” refers to one of those three methods. D.I. # 113, Def. PFF ¶¶ 157, 213–217, 307, 310–311. There is nothing inconsistent in the industry’s understanding that “injecting into flue gas” refers to a method that involves injection locations that are less than the total region of flue gas locations. Notably, neither “flue gas” nor “injecting into flue gas” encompasses the combustion zone, which is why Plaintiffs have scoured the literature hoping to find any and all off-hand references to argue that flue gas is in the region near where combustion occurs. D.I. # 107, Pl. Op. Br. 62–63. None of those “flue gas” references can overcome the fact that the ’692 Patent

does not teach injection of a “thermolabile molecular bromine precursor” into the combustion zone, or using such a precursor to pre-treat coal.

II. Plaintiffs Fail to Prove That Even If They Prevail on All Claim Construction Issues, They Are Entitled to Summary Judgment of Infringement by the Power Plants.

Plaintiffs assert that they are entitled to summary judgment that the power plant Defendants infringe claims 1 and 19 of the '692 Patent if the Court adopts each of Plaintiffs' proposed claim constructions. *See* D.I. # 107, Pl. Op. Br. 84–86; 280 Case D.I. # 112, Pl. Op. Br. 84–86. Even under those circumstances, however, the motion should be denied, because Plaintiffs have not shown beyond legitimate dispute that they are entitled to judgment that the accused process involves “injecting . . . into . . . flue gas” or that the material injected is a “bromide compound” and otherwise meets the requirements of a “thermolabile molecular bromine precursor,” as required by the claims.

A. If Defendants Prevail on Any Aspect of Claim Construction, There Is No Infringement.

Plaintiffs' motion for summary judgment of infringement rests entirely on the application of their proposed claim constructions to the accused processes. Plaintiffs do not, and could not, argue that they are entitled to summary judgment of infringement under the constructions advanced by Defendants, or indeed if the Court issued any construction other than the broad and vague interpretations advanced by Plaintiffs. *See* D.I. # 112, Def. Op. Br. 59–63 (explaining that summary judgment of noninfringement is warranted under Defendants' proposed constructions). Accordingly, Plaintiffs' motion for summary judgment of infringement should be denied if the Court's construction of *any* of the disputed claim terms differs from that proffered by Plaintiffs.

Moreover, even if Plaintiffs prevailed on all aspects of claim construction, summary judgment of infringement would still be unwarranted because Plaintiffs have failed to meet their burden of production of evidence of infringement in several distinct ways.

Most significantly, Plaintiffs have failed to cite evidence that the accused power plant introduces a thermolabile molecular bromine precursor into the combustion zone of the accused plant. This is the predicate for Plaintiffs' theory of infringement. Yet the entire factual basis for Plaintiffs' motion on this issue is Plaintiffs' PFF ¶¶ 801–803—one of which is Defendants' answer to an allegation concerning the ownership of the plant, and two of which are objected-to, incomplete hypothetical deposition questions about infringement directed to Defendants' expert witness. The cited proposed findings are an inadequate basis for summary judgment.

First, at the time of the deposition, Plaintiffs and Defendants had each proposed *different* constructions for the term “thermolabile molecular bromine precursor,” which were subsequently modified in favor of an agreed-upon construction. *Compare*. D.I. # 60, Original Joint Claim Construction Chart (Mar. 22, 2019) *with* D.I. # 88, Amended Joint Table of Terms Requiring Construction (Apr. 12, 2019), changing proposed construction of “thermolabile molecular bromine precursor”. Accordingly, the basis for the questions to which Dr. Wilcox responded is not the same as the predicate for Plaintiffs' motion.

Second, Plaintiffs' expert witness, Dr. Andrew Fry, has opined that determination of whether any substance is a thermolabile molecular bromine precursor requires extensive analysis of at least a dozen factors. D.I. # 113, Def. PFF ¶¶ 332–334.

Although Dr. Fry has asserted that he can conclude that calcium bromide meets those requirements when used in a plant such as the Weston unit, D.I. # 113, Def. PFF ¶¶ 336–337, there is no evidence that *refined coal* meets that standard—or, for that matter, that calcium bromide in an environment of pulverized coal meets that standard. That shortcoming not only punctures Plaintiffs’ request for summary judgment of infringement, but, as explained in Defendants’ motion, supports entry of judgment of noninfringement.

B. Summary Judgment of Infringement is Unwarranted for Other Independent Reasons.

Another distinct reason that summary judgment would be unwarranted is that Plaintiffs have not offered evidence that the Refined Coal is a “bromide compound” as required by the independent claims of the ’692 Patent. Plaintiffs assert that the plants inject “pulverized Refined Coal into the combustion zone of the furnace,” D.I. # 107, Pl. Op. Br. 85, but do not assert that the pulverized Refined Coal is a “bromide compound that is a thermolabile molecular bromine precursor.” Refined Coal is prepared by adding calcium bromide, and other compounds, to untreated coal, and then pulverizing the coal. D.I. # 108, Pl. PFF ¶¶ 142, 830. Plaintiffs have offered no evidence that the calcium bromide remains as calcium bromide, or any bromide compound, after its introduction to and interaction with the coal, let alone that it does so at the specific accused systems. And Defendants’ expert, Dr. Wilcox, provides evidence to dispute Plaintiffs’ assertion. She explains that “[t]he addition of aqueous calcium bromide in MerSorb to coal, the addition of S-Sorb to coal, and the pulverization of the resulting refined coal, creates a complex new chemical form.” Def. Supp. PFF ¶ 941.

Finally, Plaintiffs assert that the “[CaBr₂] will decompose at those flue gas temperatures and subsequently generate molecular bromine (Br₂), and thereafter, that the molecular bromine will act to effect oxidation of elemental mercury,” D.I. # 107, Pl. Op. Br. 85, but for this “fact” cite only to a portion of Dr. Wilcox’s deposition where she was asked a hypothetical by the deposing attorney, *id.* (citing D.I. # 108, Pl. PFF ¶¶ 801–803). Part of that hypothetical asked Dr. Wilcox to assume that the Court agreed with Plaintiffs that “when the pulverized refined coal is injected into the combustion zone of the furnace, that that is injecting a thermolabile molecular bromine precursor into flue gas.” Def. Supp. PFF ¶ 942. That line of hypothetical questioning, which asked Defendants’ expert witness to *assume* that the CaBr₂ used to make refined coal will generate Br₂, *id.*, is not sufficient to meet Plaintiffs’ burden of proof that the CaBr₂ used to make refined coal will *in fact* generate Br₂.

III. Summary Judgment Dismissing Defendants’ Invalidity Challenges Based on the *Vassilev* Reference Should Not Be Granted.

Plaintiffs seek summary judgment on the issue of whether the Asserted Claims are invalid as anticipated by the burning of coal that naturally contains bromine. Coal with bromine is disclosed in *Vassilev*, D.I. # 108, Pl. PFF ¶ 806, but all coal naturally contains bromine, including the coal used at the accused power plants, as Plaintiffs admit. Def. Supp. PFF ¶ 935E (D.I. # 71, Fry Dep. 54:23–56:21).

Plaintiffs suggest that such a result is “absurd,” but it is the necessary result of Plaintiffs’ staggeringly broad claim constructions, the impact of which is shown in statements by the inventor and by Plaintiffs’ own expert witness, Andrew Fry:

My invention was not about introducing a thermolabile molecular bromine precursor into any particular location in the coal-fired furnace or elements downstream of the furnace.

D.I. # 113, Def. PFF ¶ 364 (D.I. # 38-3, Oehr Decl. ¶ 7).

In my opinion, a person of skill in the art at the time of the invention would understand that “injection” of a bromine precursor into the “flue gas” occurs regardless of whether the compound being injected has been mixed with coal before injection. A person of ordinary skill in the art would not read the teachings of the ’692 Patent to limit the claimed injecting step to a bromine precursor alone or excluding a mixture of coal.

Def. Supp. PFF ¶ 935C (D.I. # 78, First Fry Report ¶ 118). This shows that Plaintiffs’ position in litigation is that the ’692 Patent covers coal combustion with thermolabile molecular bromine precursors regardless of where the precursor is introduced into the system or how it gets there.

In reaching to accuse Defendants of infringement, Plaintiffs seek to stretch the ’692 Patent’s claims to encompass any thermolabile molecular bromine precursor introduced into a coal combustor by any means. The claims, so construed, would read on the burning of coal that naturally contains bromine. For example, Plaintiffs have asserted that under their proposed claim construction, Claim 1’s requirement of injecting a thermolabile molecular bromine precursor into the flue gas is satisfied by feeding coal with a thermolabile molecular bromine precursor into the combustion zone. D.I. # 107, Pl. Op. Br. 85 (arguing that “the injected calcium bromide (CaBr_2) will decompose at those flue gas temperatures[,] subsequently generate molecular bromine (Br_2), and thereafter, . . . the molecular bromine will act to effect oxidation of elemental mercury”). With that reading, coal with naturally-occurring bromine is itself a bromide compound that is a thermolabile molecular bromine precursor, and therefore, anytime such coal is fed into the furnace, this claim element is performed.

Plaintiffs resist this logical result, stating without citation that: “If the Court adopts Plaintiff’s construction of the claims, the claims *require* the injected thermolabile

molecular bromine precursor to be something that must be added to the system and is not found in native, untreated coal.” *Id.* 87 (emphasis added). But none of Plaintiffs’ proposed constructions introduces any such limitation. Indeed, Defendants have offered evidence that there is no such requirement contained in Plaintiffs’ original proposed construction. In her opening report, Defendants’ expert witness, Dr. Wilcox, opines that

Under the Plaintiffs’ understanding of the claims, combustion of any coal that contains bromine would be injection [*sic*] into the flue gas of a thermolabile molecular bromine precursor, because some of the bromine naturally present in the coal will be decomposed, and volatized, upon combustion in a coal-fired furnace.

Def. Supp. PFF ¶ 935D (D.I. # 81, First Wilcox Report ¶ 190; *see also id.* ¶¶ 191–203).

After the conclusion of technical expert discovery, the parties negotiated a joint amended proposed construction for the term “bromide compound that is a thermolabile molecular bromine precursor.” D.I. # 88, Amended Joint Table of Terms Requiring Construction at 3. That construction does not reflect or include an additional requirement that the thermolabile molecular bromine precursor be something that is added to natural coal. *Id.* The parties made that agreement knowing that Defendants included the *Vassilev* reference in their initial and final invalidity contentions, and in Dr. Wilcox’s expert reports, and that Dr. Wilcox had provided the above-quoted opinion. Def. Supp. PFF ¶¶ 950–953 (D.I. # 99-42 (Defendants’ Invalidity Contentions) (Dec. 17, 2018); D.I. # 81, First Wilcox Report (Jan. 29, 2019); D.I. # 82, Second Wilcox Report (Mar. 6, 2019); D.I. # 83, Third Wilcox Report (Mar. 15, 2019)).

Plaintiffs do not offer any expert testimony in support of their new, belated proposed claim construction. Instead, they try to justify this new claim limitation based on the reference in the ’692 Patent to “enhanced” mercury control. D.I. # 107, Pl. Op. Br.

82–83. Enhancement is a question of degree, and Plaintiffs suggest that the patent requires a comparison between coal burned without “something added to the system” and “enhanced material.” *Id.* at 86. This argument is defective for two reasons.

First, it requires an evidentiary basis that Plaintiffs have not bothered to supply. Namely, Plaintiffs’ position would read into the claim a requirement that the addition of the thermolabile molecular bromine precursor actually enhances mercury control when compared to coal that has naturally-occurring bromine, but Plaintiffs have offered no proof on that issue. Different types of coal have different amounts of mercury and halogens, D.I. # 113, Def. PFF ¶¶ 98, 280, and no general conclusion can be drawn from the record. Nor have Plaintiffs sought to explain how other, pre-existing emissions control systems affect the comparison. Moreover, the ’692 Patent provides no written description for how such an analysis should be done.

Second, the prior art teaches that mercury capture can be enhanced through the use of combustibles with naturally-occurring halogens. For example, the Ide ’882 Patent teaches that the chlorine content of waste gases can be increased either by addition of hydrogen chloride gas or by burning “wastes already contain[ing] such chlorine containing materials.” D.I. # 113, Def. PFF ¶ 213. Thus, there is no reason to believe that “enhancement” draws a distinction between additive use and fuel selection, such that “enhanced mercury capture” would require the use of additives.

Plaintiffs also argue that the claim’s teaching of “a method of *treating* coal combustion flue gas,” (D.I. # 107, Pl. Op. Br. 82 (emphasis added)) implies adding a “treatment.” But Plaintiffs’ expert, Andrew Fry, undercut that position when he admitted at his deposition that the use of naturally-occurring bromine “treats” flue gas by reacting

with the mercury in the flue gas, just like separately added bromine. Def. Supp. PFF ¶ 935E (D.I. # 77, Fry Dep. 54:23–56:21).

Plaintiffs’ newly proposed construction attempts to create a new claim limitation to avoid the prior art, but Plaintiffs have neither substantiated that position nor shown how Defendants here practice this additional element. Summary judgment is not appropriate on this untimely, ill-defined construction.

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A horizontal bar chart with two bars. The first bar, representing the current government, is dark blue and extends to 85% on the x-axis. The second bar, representing the previous government, is light blue and extends to 15% on the x-axis. The y-axis labels are 'Current government' and 'Previous government'. The x-axis is labeled 'Percentage of respondents' and ranges from 0 to 100.

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CONCLUSION

For the foregoing reasons, the Court should deny Plaintiffs' motions for summary judgment on each of the points discussed above. For the reasons set forth in Defendants' own motions for summary judgment, the Court should award summary judgment to Defendants and enter final judgment in their favor.

Specifically, in connection with Plaintiffs' motions, the Court should hold that:

- (1) The correct constructions of the asserted claims of the '692 Patent are the constructions proposed by Defendants (Arg. § I);
- (2) Defendants WPL, WPS, and MGE do not directly infringe the asserted claims of the '692 Patent (Arg. § II);
- (3) Under Plaintiffs' claim construction, there is a genuine dispute of fact as to whether *Vassilev* anticipates or renders obvious the asserted claims of the '692 Patent (Arg. § III);
- (4) If the use of Refined Coal "lead[s] to introduction of calcium bromide into Columbia Unit 1 flue gas," then Defendant WPL and its sublicensees have an express license under the '692 Patent to use and have made Refined Coal (Arg. § IV);
- (5) Defendants have an implied license to practice the '692 Patent (Arg. § V);
- (6) Plaintiffs are equitably estopped from asserting the '692 Patent against Defendants (Arg. § VI); and
- (7) The Court lacks subject-matter jurisdiction over these actions (Arg. § VII).

Dated: June 14, 2019

Respectfully submitted,

/s/ Kristin Graham Noel

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